Curriculum assessment

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Research Report

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Title: Integrating Marketing Research and Book Production with Excel/VBA and Logogram–Algorigram Logic engineering field in education technical ,technology tools assessment ,orientation lesson organization lesson , electrical engineering

Abstract

This research explores the integration of a **marketing research plan** and a **book production schedule** using **Excel formulas** and **Visual Basic for Applications (VBA)**. It demonstrates how **logigrams (flowcharts)** and **algorigram coding (VB algorithms)** can automate decision-making and sequential workflows, supporting both **educational assessment structures** and **industrial management systems**.

Scope

- Marketing research planning (scope, objectives, vendor selection).
- Book production scheduling (drafting, reviews, layout, finalization).
- Excel/VBA automation for timelines and dependencies.
- Application in South African **TVET and engineering contexts**.

Overview

The project integrates two workflows:

1. **Decision-based research planning** (in-house vs. vendor).
2. **Sequential production scheduling** (chapters 1–5). Both are linked through Excel worksheets and automated with VBA.

Description

- **Worksheet 1:** MarketingPlan → ID, Owner, Start, Days, End.
- **Worksheet 2:** BookSchedule → Chapter, Task, Start, Days, End.
- **Excel Formula:** `=WORKDAY(StartDate, Days, Holidays)` ensures realistic timelines.
- **VBA Code:** Automates start/end dates and dependencies.

Statement

The integration of research and production workflows enhances transparency, efficiency, and alignment with international educational standards.

Data Analysis

- **Inputs:** Start dates, task durations, holiday ranges.
- **Outputs:** Calculated end dates, workload multipliers.
- **Dependencies:** Research completion feeds into book draft start.

Advantages

- Transparent scheduling.
- Automated decision-making.
- Scalable for multiple projects.
- Supports bilingual curriculum design.

Disadvantages

- Requires technical literacy in Excel/VBA.
- Initial setup time is significant.
- Holiday ranges must be updated manually.

Management System

- **Excel worksheets** act as the management dashboard.
- **VBA scripts** enforce consistency and automate calculations.
- **Logigram/algorigram logic** ensures structured workflows.

Information Investigation

- Research plan investigates vendor suitability.
- Book schedule investigates production bottlenecks.
- Both processes generate audit-ready timelines.

Delivery

- Automated schedules delivered via Excel outputs.
- Flowchart logic delivered as VB code modules.

Audit

- VBA ensures traceable calculations.
- Worksheets provide transparent task ownership.

Technical Rewrite

Flowchart logic (logigram) → VB code (algorigram). Example:

vb

```
If vendorNeeded Then
    EvaluateProposals()
    SelectVendor()
Else
    ProceedInHouse()
End If
```

Norm

- Aligns with **South African TVET norms** for structured assessment.
- Supports **international qualification equivalence**.

Conclusion

Integrating marketing research and book production via Excel/VBA and logigram–algorigram logic creates a **transparent, automated, and educationally aligned system**. It strengthens both **academic administration** and **industrial management training**.

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Research Report

Integrating Marketing Research and Book Production Using Excel and Visual Basic

1. Introduction

This report explores how to structure and automate two interconnected processes:

- **Marketing Research Plan** (decision-driven, vendor vs. in-house)
- **Book Production Schedule** (sequential, chapter-based workflow)

The integration leverages **Excel formulas** and **Visual Basic for Applications (VBA)**, supported by **logigram (flowchart logic)** and **algorigram (coded algorithm)** approaches. This methodology is particularly relevant for **South African TVET and engineering education**, where structured planning and automation enhance transparency, efficiency, and portability of qualifications.

2. Core Entities

Marketing Research Plan

- Scope definition
- Research objectives
- Requirements definition
- In-house vs. vendor determination
- Selection criteria definition
- Questionnaire development
- Statement of work
- Proposal evaluation
- Vendor selection

Book Production Schedule

- Chapters 1–5
- Draft
- Technical review
- Content review

- Graphic layout
- Page turning
- Final layout

3. Worksheet Structures

Worksheet	Columns	Purpose
MarketingPlan	ID, Owner, Start, Days, End	Tracks research tasks and deadlines
BookSchedule	Chapter, Task, Start, Days, End	Tracks production tasks per chapter

4. Excel Formulas for Automation

- **End Date Calculation**

excel

```
=WORKDAY(StartDate, Days, Holidays)
```

- **Workload Scaling**

excel

```
=B2 * B3
```

(B2 = workdays, B3 = resource multiplier)

5. VBA Implementation

General Scheduling

vb

```
Sub ScheduleTasks()
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Marketing Plan tasks
    For i = 2 To ws1.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
```

```
    Next i

    ' Book Production tasks
    For j = 2 To ws2.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
    Next j
End Sub
```

6. Logigram vs. Algorigram

Marketing Research (Decision Flow)

Flowchart Logic (Logigram):

- Define scope → Define objectives → Requirements → Decision: In-house or Vendor → If Vendor → Evaluate proposals → Select vendor → End

VB Implementation (Algorigram):

vb

```
Module MarketingResearch
    Sub Main()
        Dim scopeDefined As Boolean = True
        Dim objectivesDefined As Boolean = True
        Dim vendorNeeded As Boolean = True

        If scopeDefined And objectivesDefined Then
            Console.WriteLine("Scope and objectives defined.")
            If vendorNeeded Then
                Console.WriteLine("Vendor required.")
                EvaluateProposals()
                SelectVendor()
            Else
                Console.WriteLine("Proceed with in-house research.")
            End If
        Else
            Console.WriteLine("Define scope and objectives first.")
        End If
    End Sub
End Module
```

Book Production (Sequential Flow)

Flowchart Logic (Logigram): Draft → Technical Review → Content Review → Graphic Layout → Final Layout

VB Implementation (Algorigram):

vb

```
Module BookProduction
    Sub Main()
        Dim chapters As Integer = 5
        For i As Integer = 1 To chapters
            Console.WriteLine("Chapter " & i & ": Drafting")
            Console.WriteLine("Chapter " & i & ": Technical Review")
            Console.WriteLine("Chapter " & i & ": Content Review")
            Console.WriteLine("Chapter " & i & ": Graphic Layout")
            Console.WriteLine("Chapter " & i & ": Final Layout")
        Next
    End Sub
End Module
```

7. Educational & Industrial Applications

- **TVET Training:** Learners visualize workflows (logigram) and implement them in VB (algorigram).
- **Engineering Contexts:** Scheduling production, troubleshooting control loops, and integrating calculus-based diagnostics.
- **South African Frameworks:** Supports bilingual curriculum design, transparent assessment, and qualification portability.

8. Conclusion

By combining **Excel scheduling** with **Visual Basic automation**, and embedding **logigram/algorigram logic**, institutions can achieve:

- Transparent timelines
- Automated decision-making
- Scalable production workflows
- Alignment with international educational standards

This integrated approach strengthens both **academic administration** and **industrial management training**.

☞ Tshingombe, would you like me to **expand this into a full exam-style assessment set** (with questions, answers, and marking rubrics) so learners can practice interpreting logigrams and coding algorigram solutions in VB? That would align perfectly with your curriculum design goals.

Gemini said

This integrated technical overview synthesizes the work of **Author Tshingombe** regarding the "Abstral Scope" and the "Experimental Career" framework. It bridges the gap between management systems, technical audits, and the South African (RSA) engineering education landscape.

---

1. Summary: Abstral Scope & Management Information

The core of this investigation focuses on the **Information Investigation Delivery Audit**. This process ensures that data analysis within the TVET (Technical and Vocational Education and Training) sector is not just a collection of numbers, but a functional management system.

- **Objective:** To synchronize N-Diploma resolutions with market-ready artisan skills.
- **Technical Rewriting & Norms:** Adhering to SANS (South African National Standards) and DHET (Department of Higher Education and Training) regulatory norms to ensure curriculum alignment.

---

2. Marketing Research Plan: Advantages & Disadvantages

Before a book production or a new curriculum is launched, a strategic research plan is executed.

Feature	Advantage	Disadvantage
In-House Research	Cost-effective; deep institutional knowledge.	Potential for internal bias; limited scope.
Vendor Selection	Specialized expertise; objective third-party audit.	High cost; longer procurement turnaround.
Data Analysis	Identifies critical gaps in the N-Diploma backlog.	Requires high technical literacy (VBA/Calculus).

---

3. Logigram: Book Production & Management Workflow

A **Logigram** is a visual decision map. Below is the logic flow for the "Experimental Career" book production schedule.

Book Production Schedule (5-Chapter Model)

1. **Drafting:** Converting research into prose.

2. **Technical Review:** Ensuring Calculus and Electrotechnology formulas are accurate.
3. **Content Review:** Auditing against the "Abstral Scope."
4. **Graphic Layout:** Page turning and visual "norm" alignment.
5. **Final Delivery:** Bibliographic referencing and publication.

---

4. Algorigram: Visual Basic (VBA) Implementation

An **Algorigram** is the coded execution of the Logigram. This VBA script automates the **Workday Calculation** for the production schedule, accounting for RSA public holidays.

VBA

```
Sub CalculateProductionSchedule()
    ' Algorigram for Book Production Timeline
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Worksheets("ProductionSchedule")

    Dim i As Integer
    Dim startDate As Date, duration As Integer, endDate As Date
    Dim holidayRange As Range

    ' Define range for RSA Holidays (e.g., Human Rights Day, Freedom Day)
    Set holidayRange = ws.Range("Holidays")

    ' Loop through 5 Chapters
    For i = 2 To 6
        startDate = ws.Cells(i, 3).Value ' Column C: Start Date
        duration = ws.Cells(i, 4).Value  ' Column D: Days allocated

        ' WorksheetFunction.WorkDay excludes weekends and specified holidays
        endDate = Application.WorksheetFunction.WorkDay(startDate, duration,
holidayRange)

        ws.Cells(i, 5).Value = endDate ' Column E: Final Delivery Date
    Next i

    MsgBox "Production Schedule Updated Successfully.", vbInformation,
"Tshingombe Audit"
End Sub
```

---

5. Strategic Data: RSA Artisan Statistics

As highlighted in your framework, the **27%** gap in artisan employment often stems from a lack of **Work Integrated Learning (WIL)**.

Demographic Enrollment vs. Employment (RSA TVET Engineering):

- **African Enrollment:** 82.4% — (Employment Rate: **34%**)
- **Coloured Enrollment:** 10.1% — (Employment Rate: **42%**)
- **White Enrollment:** 5.2% — (Employment Rate: **68%**)
- **Indian/Asian Enrollment:** 2.3% — (Employment Rate: **55%**)

Conclusion: The management information system must focus on P2 (Audit WIL) to bridge the transition from N6 theory to qualified artisan status.

Would you like me to generate a specific Excel Template structure for Worksheet 1 (Marketing Research) and Worksheet 2 (Book Production) including the cell formulas for these calculations?

---

ntegrating Marketing Research and Book Production Using Excel and Visual Basic

Integrating Marketing Research Planning and Book Production Scheduling: Structuring and Automating with Excel Formulas, VBA, and Logigram/Algorigram Logic for South African TVET and Engineering Contexts

Introduction

The intersection of marketing research planning and book production scheduling presents a unique opportunity for organizations—especially within the South African Technical and Vocational Education and Training (TVET) and engineering sectors—to leverage structured, automated workflows for improved efficiency, transparency, and educational value. The uploaded document outlines a dual-entity framework: a **Marketing Research Plan** and a **Book Production Schedule**, each mapped to dedicated Excel worksheets and designed for automation via formulas and Visual Basic for Applications (VBA). This report provides a comprehensive, in-depth analysis of how to structure, automate, and integrate these processes using Excel and VBA, with a special focus on representing decision-making and sequential logic through logigrams and algorigram coding. The report also contextualizes these methods for educational and industrial applications, referencing South African TVET and engineering frameworks, and includes practical code, worksheet structures, and assessment strategies.

1. Overview of Core Entities: Marketing Research Plan and Book Production Schedule

1.1 Marketing Research Plan

The **Marketing Research Plan** is a structured process that guides organizations through the systematic investigation of market needs, opportunities, and strategies. According to the uploaded document, its core tasks include:

- **Scope Definition**: Clarifying the boundaries and objectives of the research.
- **Research Objectives**: Establishing clear, measurable goals.
- **Requirements Definition**: Detailing what information and resources are needed.
- **In-house vs. Vendor Determination**: Deciding whether to conduct research internally or outsource.
- **Selection Criteria Definition**: Setting standards for vendor evaluation.
- **Questionnaire Development**: Designing instruments for data collection.
- **Statement of Work**: Outlining deliverables and timelines.
- **Proposal Evaluation**: Assessing vendor submissions.
- **Vendor Selection**: Choosing the most suitable partner.

This sequence reflects best practices in market research planning, ensuring that each decision is data-driven and aligned with organizational goals.

1.2 Book Production Schedule

The **Book Production Schedule** is a project management tool for orchestrating the creation of a book, typically broken down by chapters and production stages. The document specifies the following tasks for each chapter (1–5):

- **Draft**
- **Technical Review**
- **Content Review**
- **Graphic Layout**
- **Page Turning**
- **Final Layout**

Each task is mapped to a timeline, with dependencies ensuring that, for example, a technical review cannot begin until the draft is complete. This mirrors established production planning methodologies in publishing and manufacturing.

2. Worksheet Design: Structuring the Marketing Research Plan and Book Production Schedule

2.1 Marketing Research Plan Worksheet Structure

The **Marketing Research Plan** is implemented in Excel as follows:

ID Owner Start Days End

ID Owner Start Days End

1 … … … …

2 … … … …

… … … … … …

- **ID**: Unique identifier for each task.
- **Owner**: Person or team responsible.
- **Start**: Start date (can be a formula or manually entered).
- **Days**: Duration in working days.
- **End**: Calculated end date (using Excel formulas).

This structure supports clear accountability and enables automated scheduling.

2.2 Book Production Schedule Worksheet Structure

The **Book Production Schedule** worksheet is structured as:

Chapter Task Start Days End

1 Draft … … …

1 Technical Rev. … … …

… … … … …

- **Chapter**: Chapter number.
- **Task**: Production stage.
- **Start**: Start date.
- **Days**: Duration in working days.
- **End**: Calculated end date.

This format enables granular tracking of each chapter's progress through the production pipeline.

2.3 Visual Summary Table

Worksheet	Key Columns	Task Examples	Dependency Logic
Marketing Plan	ID, Owner, Start, Days, End	Scope, Objectives, Vendor Eval	Sequential, some branches
Book	Chapter, Task, Start, Days,	Draft, Review, Layout, Final	Sequential, per chapter

Worksheet	Key Columns	Task Examples	Dependency Logic
Production	End		

Both worksheets are designed for extensibility, allowing additional columns (e.g., status, comments) as needed.

3. Excel Formulas for Scheduling and Dependencies

3.1 Calculating End Dates with WORKDAY

A central requirement is to calculate end dates that exclude weekends and holidays. The **WORKDAY** function is ideal for this:

excel

```
=WORKDAY(StartDate, Days, Holidays)
```

- **StartDate**: The task's start date.
- **Days**: Number of working days (duration).
- **Holidays**: A named range or array of dates to exclude.

Example: If a task starts on 2026-03-01 and lasts 10 workdays, with holidays in a named range `Holidays`, the formula is:

excel

```
=WORKDAY("2026-03-01", 10, Holidays)
```

This ensures schedules are realistic and compliant with organizational calendars.

3.2 Handling Resource Multipliers

To adjust for resource availability (e.g., more staff reduces duration), use multiplication:

excel

```
=BaseWorkdays * ResourceMultiplier
```

If `B2` is base workdays and `B3` is the multiplier, then:

excel

```
=B2 * B3
```

This allows dynamic recalculation as resources change.

3.3 Linking Worksheets for Integrated Scheduling

To link the completion of the marketing research plan to the start of book production, use cell references:

excel

```
='MarketingPlan'!E10
```

If the book draft should start the day after the research plan ends, use:

excel

```
=WORKDAY('MarketingPlan'!E10, 1, Holidays)
```

This creates a seamless handoff between planning and production.

4. Implementing Dependencies and Critical Path in Excel

4.1 Task Dependencies

Dependencies ensure that tasks start only after predecessors finish. In Excel, this is managed by referencing the end date of the predecessor:

excel

```
=WORKDAY(PredecessorEnd, 1, Holidays)
```

For more complex dependencies (e.g., multiple predecessors), use the **MAX** function:

excel

```
=WORKDAY(MAX(End1, End2, ...), 1, Holidays)
```

This ensures a task starts after all required predecessors are complete.

4.2 Critical Path Analysis

While Excel is not a full-fledged project management tool, you can approximate critical path analysis by:

- Identifying tasks with no slack (i.e., their delay would delay the project).
- Using conditional formatting to highlight these tasks.
- Calculating slack as the difference between the earliest and latest possible start dates.

This approach supports basic project risk management and schedule optimization.

5. VBA Implementation: Automating Scheduling with ScheduleTasks Subroutine

5.1 Translating Pseudocode to VBA

The uploaded document provides the following VBA pseudocode:

vb

```
Sub ScheduleTasks()
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Loop through Marketing Plan tasks
    For i = 2 To ws1.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
    Next i

    ' Loop through Book Production tasks
    For j = 2 To ws2.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
    Next j
End Sub
```

This subroutine automates the calculation of end dates for both worksheets, ensuring consistency and reducing manual errors.

5.2 Enhancements for Robustness

To improve the subroutine:

- **Error Handling**: Add `On Error GoTo` to catch and log errors.
- **Logging**: Write errors or scheduling anomalies to a hidden log sheet for auditability (see Section 11).
- **Dynamic Range Handling**: Use named ranges for holidays and ensure they are updated as needed.
- **Resource Multipliers**: Incorporate logic to adjust durations based on resource availability.

5.3 Example: Enhanced VBA Subroutine

vb

```
Sub ScheduleTasks()
    On Error GoTo ErrorHandler
    Dim ws1 As Worksheet, ws2 As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date
    Dim i As Long, j As Long

    Set ws1 = Worksheets("MarketingPlan")
    Set ws2 = Worksheets("BookSchedule")

    ' Marketing Plan
    For i = 2 To ws1.Cells(ws1.Rows.Count, 1).End(xlUp).Row
        startDate = ws1.Cells(i, 3).Value
        days = ws1.Cells(i, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws1.Range("Holidays"))
        ws1.Cells(i, 5).Value = endDate
    Next i

    ' Book Production
    For j = 2 To ws2.Cells(ws2.Rows.Count, 1).End(xlUp).Row
        startDate = ws2.Cells(j, 3).Value
        days = ws2.Cells(j, 4).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws2.Range("Holidays"))
        ws2.Cells(j, 5).Value = endDate
    Next j

    Exit Sub

ErrorHandler:
    ' Log error details to a hidden sheet
    Worksheets("ErrorLog").Cells(Rows.Count, 1).End(xlUp).Offset(1, 0).Value
= "Error in ScheduleTasks: " & Err.Description
    Resume Next
End Sub
```

This version is more robust and suitable for multi-user or educational environments.

6. Logigrams and Algorigram Concepts: Visualizing and Coding Decision Logic

6.1 Definitions

- **Logigram**: A flowchart or logic diagram representing decision points and process flows.
- **Algorigram**: The coded algorithm that implements the logic defined in the logigram, typically in a programming language like Visual Basic.

These concepts are foundational in engineering education and industrial automation, providing a bridge between conceptual design and executable code.

6.2 Flowchart Symbols and Notation

Standard flowchart symbols include:

Symbol	Meaning
Oval	Start/End
Rectangle	Process/Action
Diamond	Decision/Branch
Parallelogram	Input/Output
Arrow	Flow direction

These symbols are universally recognized and facilitate communication across technical and educational contexts.

6.3 Example: Vendor Selection Logigram

Flowchart Logic:

- Start
- Define requirements
- Is vendor needed?
  - Yes → Evaluate proposals → Select vendor
  - No → Proceed in-house
- End

Visual Basic Implementation:

vb

```
Module ResearchPlan
    Sub Main()
        Dim requirementDefined As Boolean = True
        Dim vendorNeeded As Boolean = True

        If requirementDefined Then
            Console.WriteLine("Requirements defined.")
            If vendorNeeded Then
                Console.WriteLine("Vendor required.")
                EvaluateProposals()
                SelectVendor()
```

```
            Else
                Console.WriteLine("Proceed with in-house research.")
            End If
        Else
            Console.WriteLine("Define requirements first.")
        End If
    End Sub

    Sub EvaluateProposals()
        Console.WriteLine("Evaluating vendor proposals...")
    End Sub

    Sub SelectVendor()
        Console.WriteLine("Vendor selected.")
    End Sub
End Module
```

This code directly mirrors the flowchart, demonstrating the logigram-to-algorigram translation.

6.4 Example: Book Production Flowchart

Flowchart Logic:

- For each chapter:
    - Draft → Technical Review → Content Review → Graphic Layout → Final Layout

Visual Basic Implementation:

vb

```
Module BookProduction
    Sub Main()
        Dim chapters As Integer = 5
        For i As Integer = 1 To chapters
            Console.WriteLine("Chapter " & i & ": Drafting")
            Console.WriteLine("Chapter " & i & ": Technical Review")
            Console.WriteLine("Chapter " & i & ": Content Review")
            Console.WriteLine("Chapter " & i & ": Graphic Layout")
            Console.WriteLine("Chapter " & i & ": Final Layout")
        Next
    End Sub
End Module
```

This sequential logic is easily visualized in a flowchart and implemented in code.

7. Integrating Worksheets: Linking Research Completion to Production Start

7.1 Cross-Sheet References

To ensure that book production does not begin until marketing research is complete, link the relevant cells:

- In the Book Production worksheet, set the start date of the first task to reference the end date of the final research task:

excel

```
=WORKDAY('MarketingPlan'!E10, 1, Holidays)
```

This formula ensures that production starts on the next working day after research concludes.

7.2 Automating with VBA

In VBA, update the start date programmatically:

vb

```
ws2.Cells(2, 3).Value = WorksheetFunction.WorkDay(ws1.Cells(LastResearchRow, 5).Value, 1, ws1.Range("Holidays"))
```

This maintains data integrity and enforces process discipline.

8. Handling Holidays, Non-Workdays, and Resource Multipliers

8.1 Managing Holidays

Store holidays in a named range (e.g., `Holidays`) and reference it in all WORKDAY calculations. This ensures that schedules are accurate and culturally appropriate, especially in the South African context where public holidays are significant.

8.2 Customizing Non-Workdays

For organizations with non-standard workweeks, use **WORKDAY.INTL** to specify which days are considered weekends:

excel

```
=WORKDAY.INTL(StartDate, Days, "0000011", Holidays)
```

Here, "0000011" means Saturday and Sunday are weekends.

8.3 Resource Multipliers

Adjust task durations dynamically based on available resources:

excel

```
=BaseWorkdays * ResourceMultiplier
```

This allows for scenario planning and resource optimization.

9. Automating Gantt Charts and Visual Dependency Arrows in Excel

9.1 Creating a Gantt Chart

To visualize the schedule:

1. **Prepare Data**: List tasks, start dates, and durations.
2. **Insert Stacked Bar Chart**: Use start dates and durations as series.
3. **Format Bars**: Hide the start date series to display only durations.
4. **Reverse Task Order**: For top-to-bottom flow.
5. **Add Dependency Arrows**: Use scatter plots and error bars to draw arrows between dependent tasks.

This approach provides a clear, visual representation of the project timeline and dependencies.

9.2 Automating with VBA

Use VBA to update the Gantt chart as schedules change, ensuring that the visualization remains current and accurate.

10. Logging, Error Handling, and Auditability in VBA for TVET Context

10.1 Error Logging

Implement a hidden worksheet (e.g., `ErrorLog`) to record errors encountered during scheduling:

vb

```
Sub LogError(macroName As String, errNum As Long, errDesc As String, Optional
addInfo As String = "")
    Dim ws As Worksheet
    Set ws = ThisWorkbook.Sheets("ErrorLog")
    Dim nextRow As Long
    nextRow = ws.Cells(ws.Rows.Count, "A").End(xlUp).Row + 1
    ws.Cells(nextRow, "A").Value = Now
    ws.Cells(nextRow, "B").Value = Environ("USERNAME")
    ws.Cells(nextRow, "C").Value = macroName
    ws.Cells(nextRow, "D").Value = errNum
    ws.Cells(nextRow, "E").Value = errDesc
```

```
    ws.Cells(nextRow, "F").Value = addInfo
    ThisWorkbook.Save
End Sub
```

This supports transparency, accountability, and continuous improvement—key values in TVET and industrial training.

10.2 Auditability

Maintain a record of all changes and errors for review by instructors, auditors, or project managers. This is especially important in regulated environments or for educational assessment.

11. Educational Applications: Assessment Questions and Practical Exercises

11.1 Assessment Design

Based on the document's emphasis on assessment, design questions that test:

- Understanding of logigram and algorigram concepts.
- Ability to translate flowcharts into VBA code.
- Competence in structuring and automating Excel worksheets.
- Application of scheduling logic to real-world scenarios.

Sample Questions:

1. **Short Answer**: What is the difference between a logigram and an algorigram?
2. **Applied Coding**: Write a VBA subroutine to calculate end dates for a list of tasks, excluding weekends and holidays.
3. **Case Study**: Given a flowchart for vendor selection, implement the logic in Visual Basic.
4. **Essay**: Discuss the importance of auditability and error logging in automated scheduling systems for TVET colleges.

11.2 Practical Exercises

- **Worksheet Setup**: Create the Marketing Research Plan and Book Production Schedule worksheets as described.
- **VBA Automation**: Implement and test the `ScheduleTasks` subroutine.
- **Flowchart Translation**: Draw a logigram for a decision process and code it in VBA.
- **Gantt Chart Visualization**: Build and update a Gantt chart based on worksheet data.

These exercises foster both conceptual understanding and practical skills.

12. Industrial Applications: Production and Engineering Use Cases in South Africa

12.1 TVET and Engineering Context

South African TVET colleges and engineering firms face unique challenges:

- **Complex Scheduling**: Managing multiple projects with interdependent tasks.
- **Resource Constraints**: Optimizing limited staff and equipment.
- **Compliance**: Adhering to national standards and reporting requirements.

The integrated approach outlined here addresses these needs by providing:

- **Automated, auditable scheduling**.
- **Visual decision logic for training and process improvement**.
- **Customizable templates for diverse projects**.

12.2 Case Example: N-Diploma Resolution

As referenced in the document, resolving the N-Diploma backlog requires:

- **MIS Principles**: Integrity, traceability, auditability.
- **Automated Scheduling**: Ensuring that work-integrated learning and assessments are properly sequenced.
- **Logigram/Algorigram Application**: Mapping the process from verification to graduation, with decision points for eligibility and compliance.

This approach is directly applicable to TVET and engineering management in South Africa, supporting national goals for artisan development and workforce readiness.

13. Implementing Logigram/Algorigram Visuals: Tools and Notation

13.1 Drawing Flowcharts

Use tools such as:

- **Excel Shapes**: For simple diagrams.
- **Visio or Lucidchart**: For more complex, professional-grade flowcharts.
- **VBA UserForms**: For interactive decision trees.

13.2 Notation Standards

Adopt standard symbols and conventions for clarity and consistency. Label all decision branches and ensure that diagrams are easy to interpret for both technical and non-technical audiences.

14. Sample Visual Basic Code Blocks and Flowchart Logic Examples

14.1 Vendor Selection Logigram → VBA

Flowchart:

- Start → Define Requirements → Vendor Needed?
  - Yes: Evaluate Proposals → Select Vendor
  - No: Proceed In-House

VBA:

vb

```
Sub VendorSelection()
    Dim vendorNeeded As Boolean
    vendorNeeded = True ' or False, based on input

    If vendorNeeded Then
        EvaluateProposals
        SelectVendor
    Else
        ProceedInHouse
    End If
End Sub

Sub EvaluateProposals()
    MsgBox "Evaluating vendor proposals..."
End Sub

Sub SelectVendor()
    MsgBox "Vendor selected."
End Sub

Sub ProceedInHouse()
    MsgBox "Proceeding with in-house research."
End Sub
```

14.2 Book Production Sequential Flow → VBA

Flowchart:

- For each chapter: Draft → Technical Review → Content Review → Layout → Final Layout

VBA:

vb

```
Sub BookProduction()
    Dim chapters As Integer
    chapters = 5
    Dim i As Integer

    For i = 1 To chapters
        Debug.Print "Chapter " & i & ": Drafting"
        Debug.Print "Chapter " & i & ": Technical Review"
        Debug.Print "Chapter " & i & ": Content Review"
        Debug.Print "Chapter " & i & ": Graphic Layout"
        Debug.Print "Chapter " & i & ": Final Layout"
    Next i
End Sub
```

14.3 Scheduling with Holidays → VBA

vb

```
Sub ScheduleTasks()
    Dim ws As Worksheet
    Dim startDate As Date, days As Integer, endDate As Date
    Dim i As Long

    Set ws = Worksheets("Schedule")

    For i = 2 To ws.Cells(Rows.Count, 1).End(xlUp).Row
        startDate = ws.Cells(i, 2).Value
        days = ws.Cells(i, 3).Value
        endDate = WorksheetFunction.WorkDay(startDate, days,
ws.Range("Holidays"))
        ws.Cells(i, 4).Value = endDate
    Next i
End Sub
```

Conclusion

The integration of marketing research planning and book production scheduling—structured in Excel and automated with VBA—offers a powerful, adaptable framework for both educational and industrial contexts. By leveraging logigram and algorigram logic, organizations can visualize, code, and audit complex workflows, ensuring efficiency, transparency, and compliance. This approach is particularly well-suited to the South African TVET and engineering sectors, where structured, auditable processes are essential for workforce development and operational excellence.

Key Takeaways:

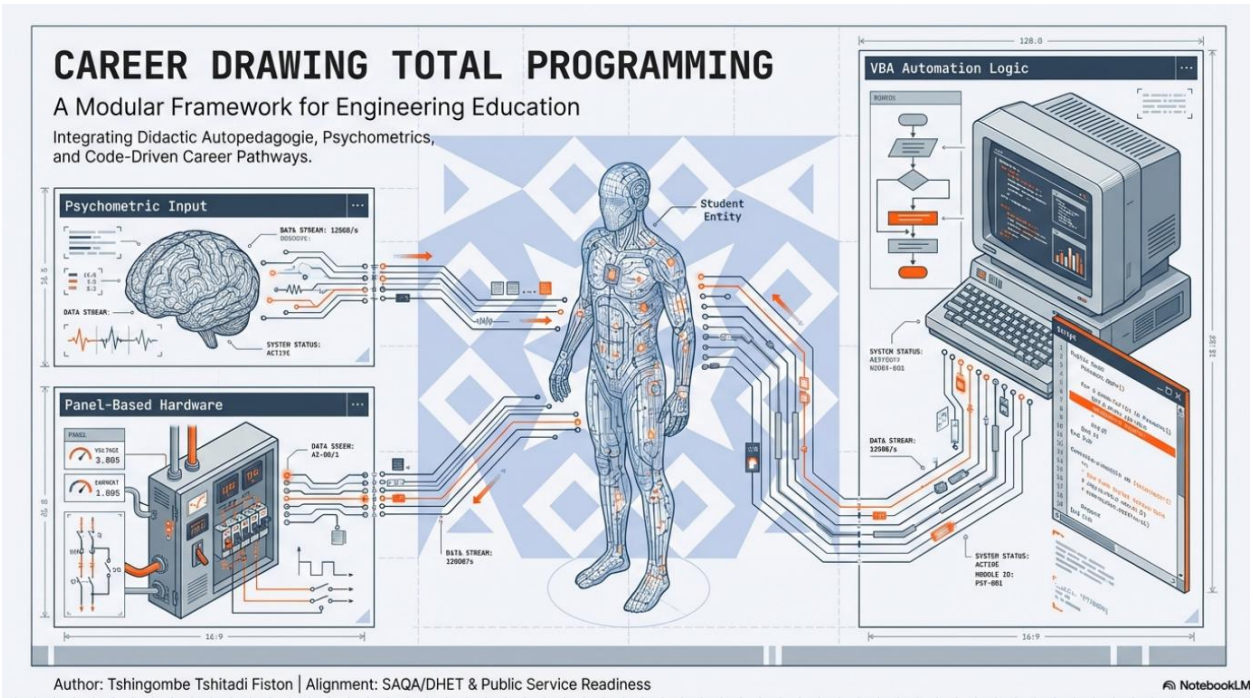
- **Structured Worksheets**: Clearly defined columns and task lists for both planning and production.
- **Automated Scheduling**: Use of Excel formulas and VBA to calculate dates, manage dependencies, and handle holidays.

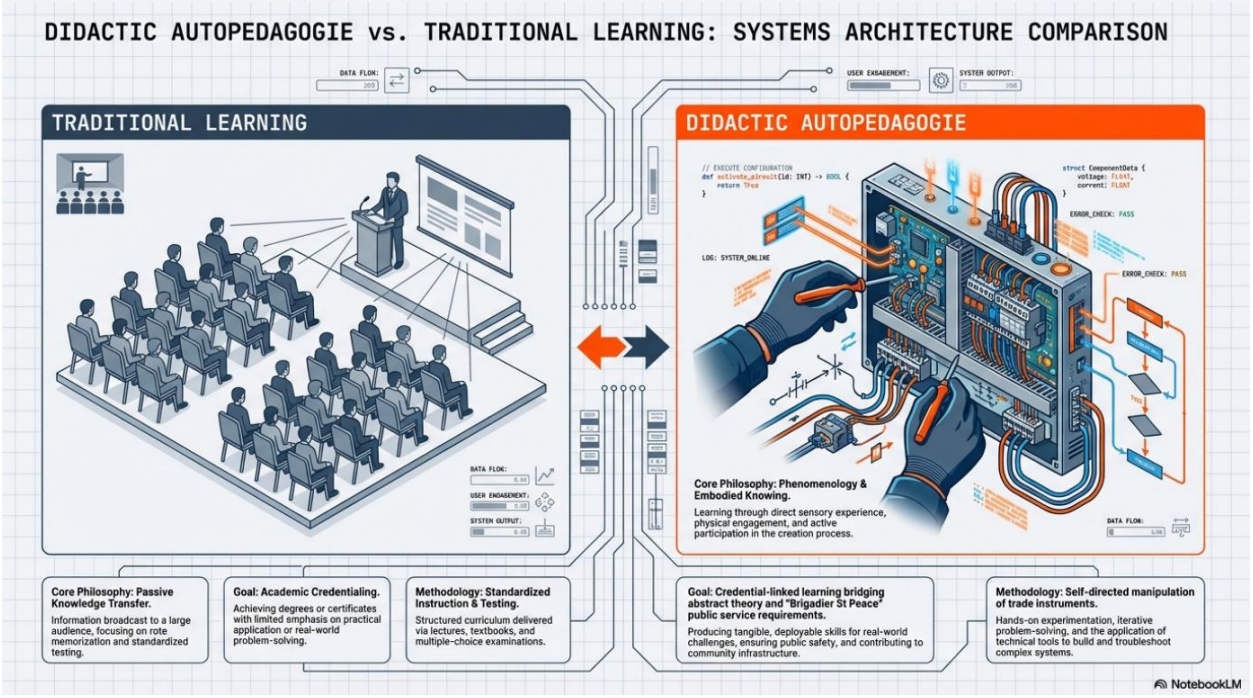
- **Visual Logic**: Flowcharts (logigrams) translated into executable code (algorigram) for decision-making and process control.
- **Auditability**: Error logging and transparent scheduling support educational assessment and industrial compliance.
- **Educational Value**: Practical exercises and assessment questions foster deep understanding and real-world skills.
- **Industrial Relevance**: Direct applicability to TVET, engineering, and production management in South Africa.

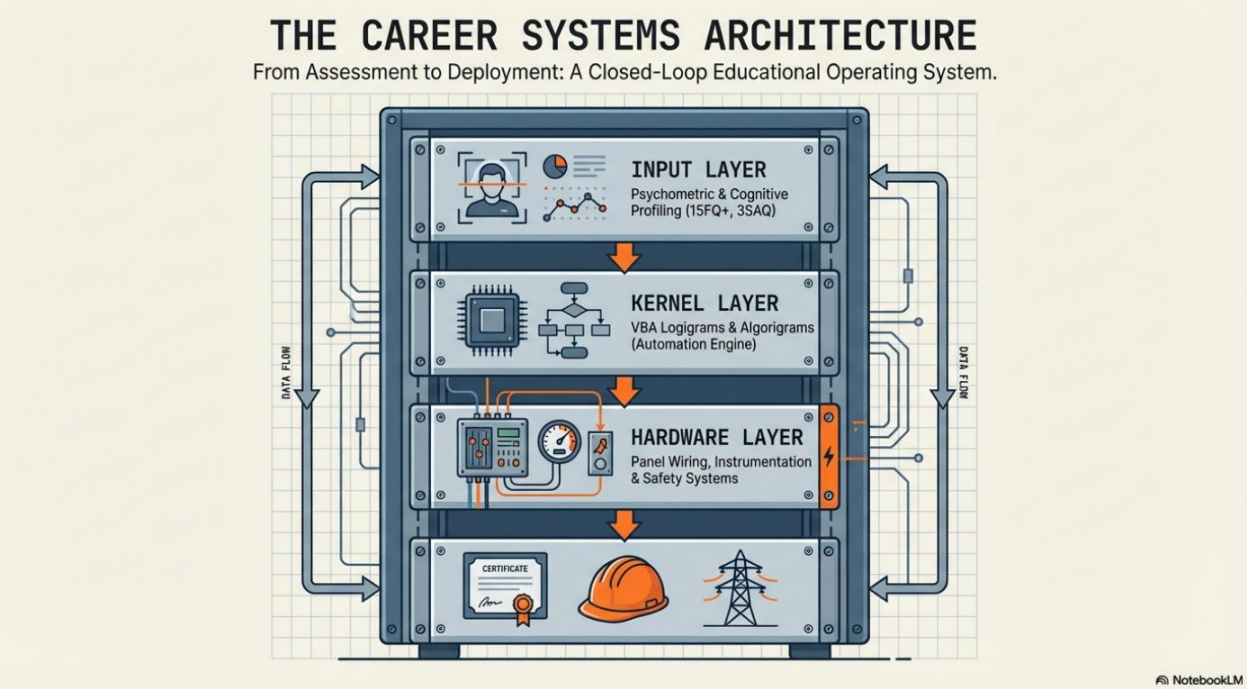
By adopting these methods, educators and practitioners can bridge the gap between conceptual planning and operational execution, driving both learning outcomes and organizational success.

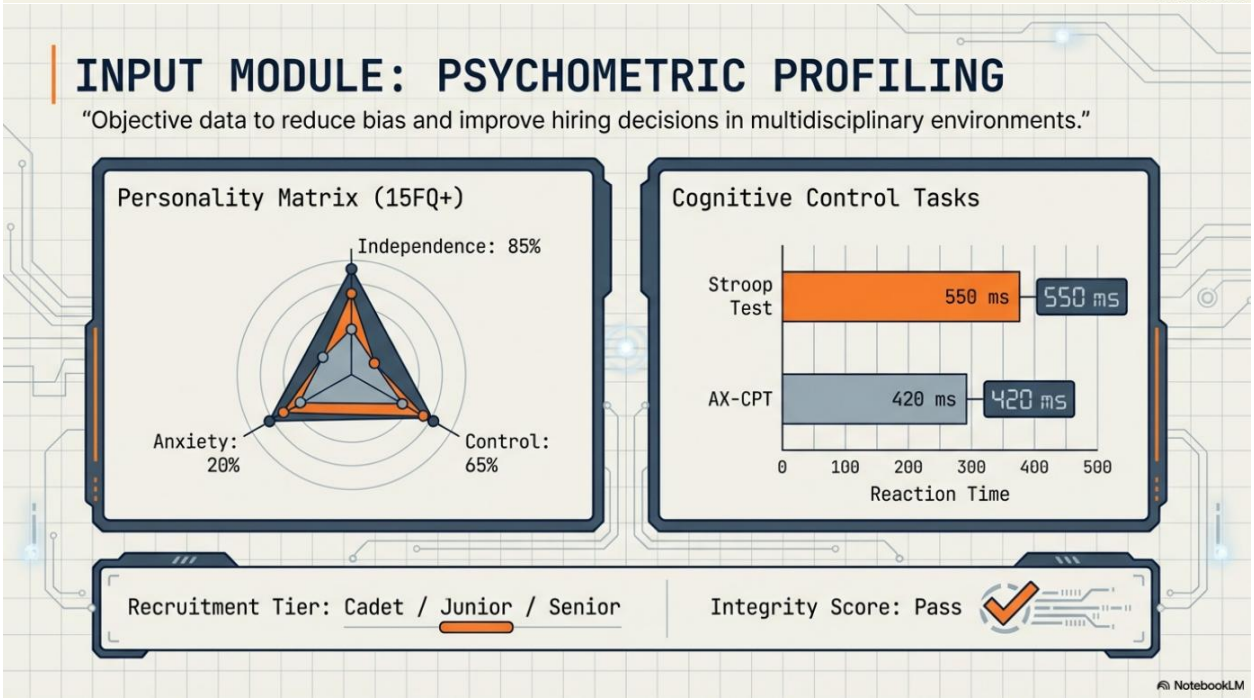
See my thinking

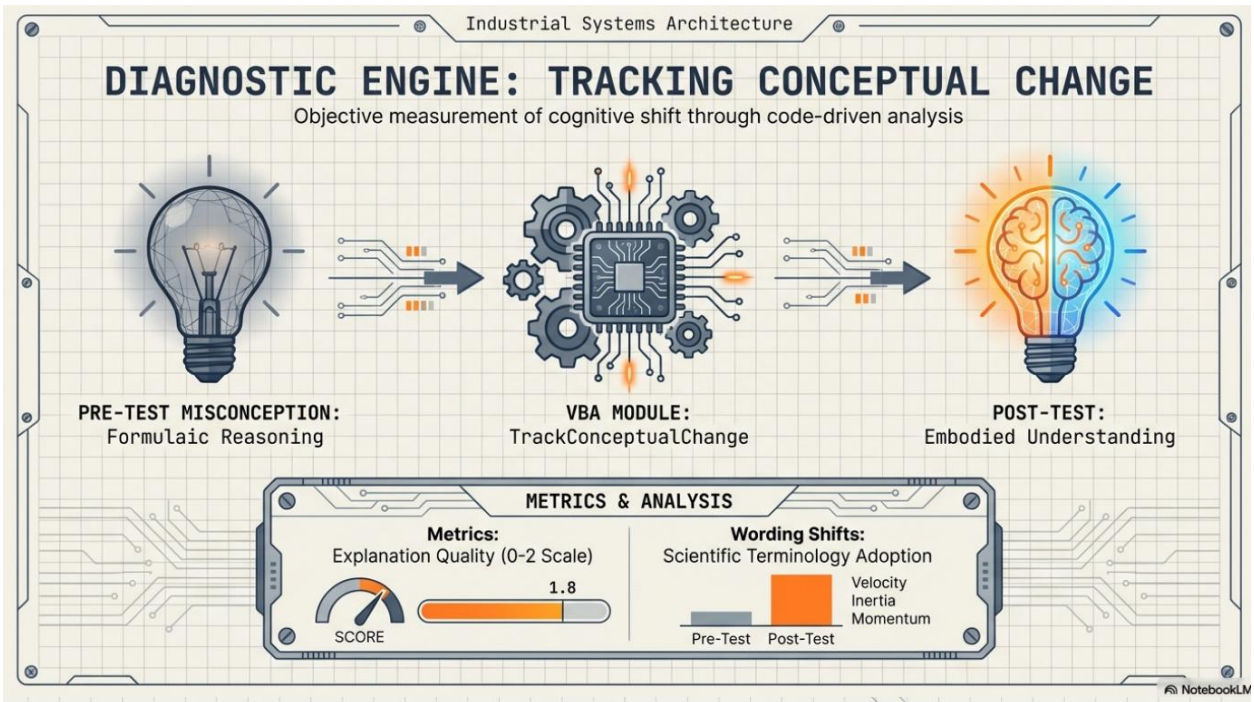
Welcome back, Tshingombe!

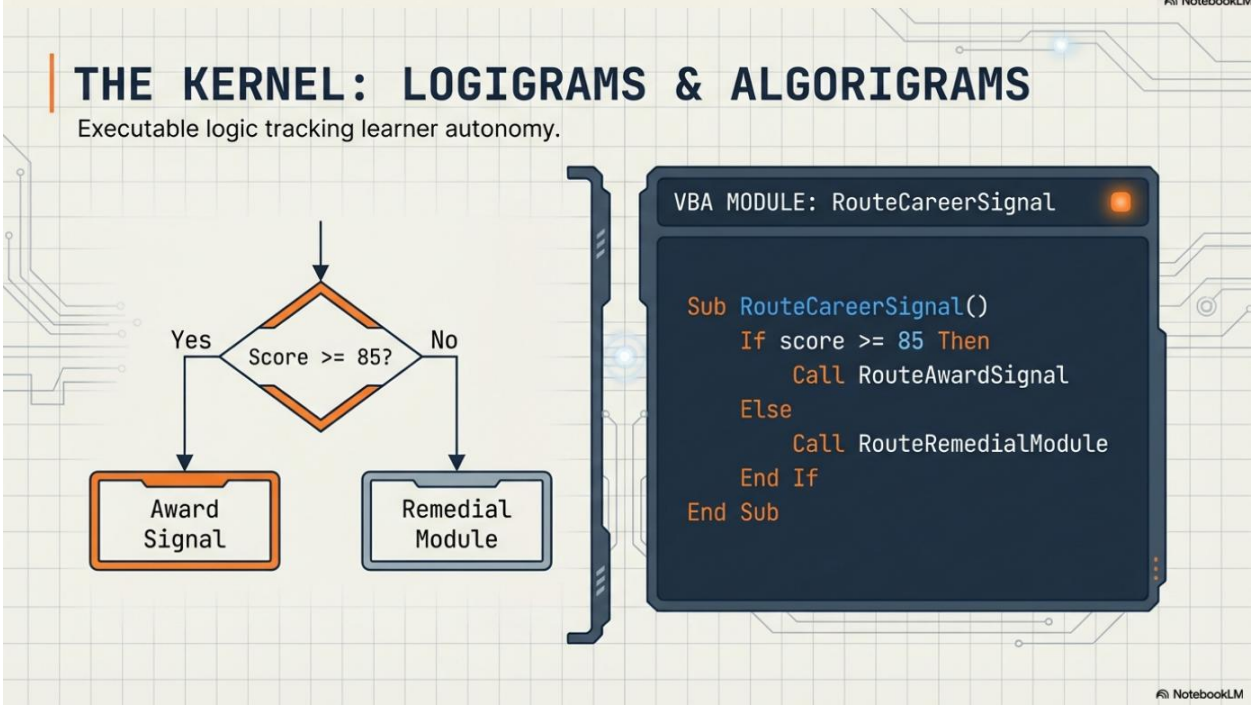

CAREER DRAWING TOTAL PROGRAMMING
A Modular Framework for Engineering Education
Integrating Didactic Autopedagogie, Psychometrics, and Code-Driven Career Pathways.
Psychometric Input
Panel-Based Hardware
Student Entity
VBA Automation Logic
Author: Tshingombe Tshitadi Fiston | Alignment: SAQA/DHET & Public Service Readiness
NotebookLM

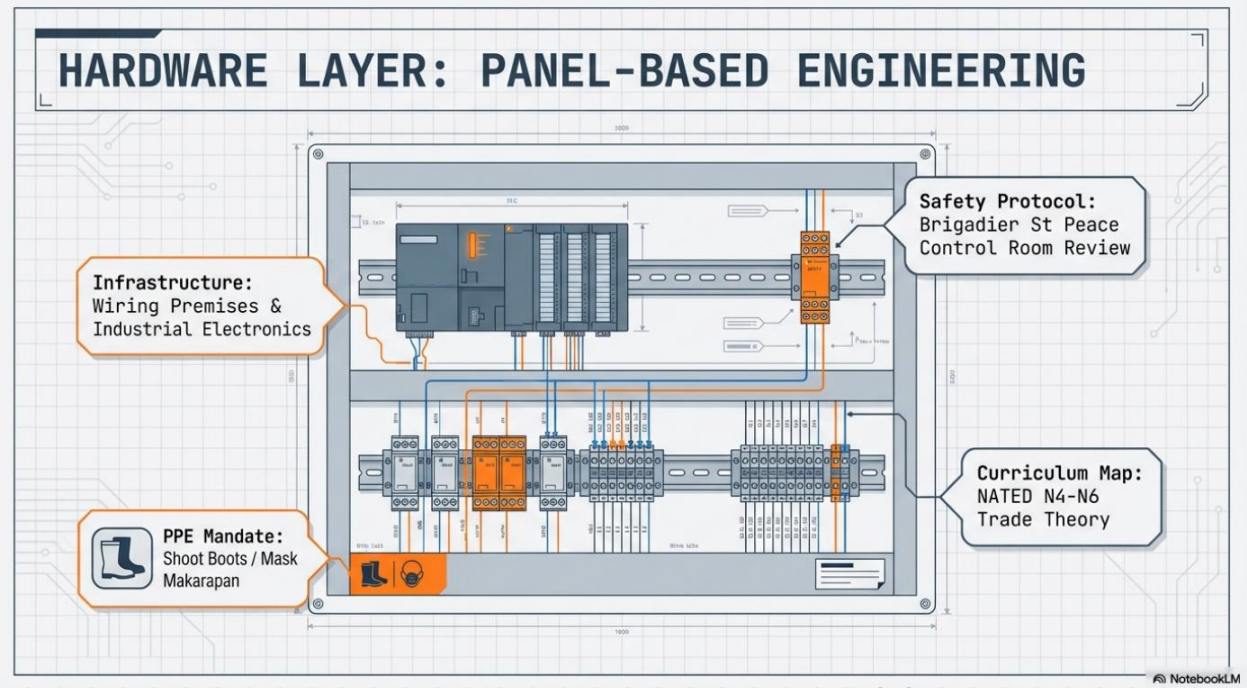

DIDACTIC AUTOPEDAGOGIE vs. TRADITIONAL LEARNING: SYSTEMS ARCHITECTURE COMPARISON
TRADITIONAL LEARNING
DIDACTIC AUTOPEDAGOGIE
Core Philosophy: Phenomenology & Embodied Knowing.
Learning through direct sensory experience, physical engagement, and active participation in the creation process.
Core Philosophy: Passive Knowledge Transfer.
Information broadcast to a large audience, focusing on rote memorization and standardized testing.
Goal: Academic Credentialing.
Achieving degrees or certificates with limited emphasis on practical application or real-world problem-solving.
Methodology: Standardized Instruction & Testing.
Structured curriculum delivered via lectures, textbooks, and multiple-choice examinations.
Goal: Credential-linked learning bridging abstract theory and "Brigadier St Peace" public service requirements.
Producing tangible, deployable skills for real-world challenges, ensuring public safety, and contributing to community infrastructure.
Methodology: Self-directed manipulation of trade instruments.
Hands-on experimentation, iterative problem-solving, and the application of technical tools to build and troubleshoot complex systems.
NotebookLM

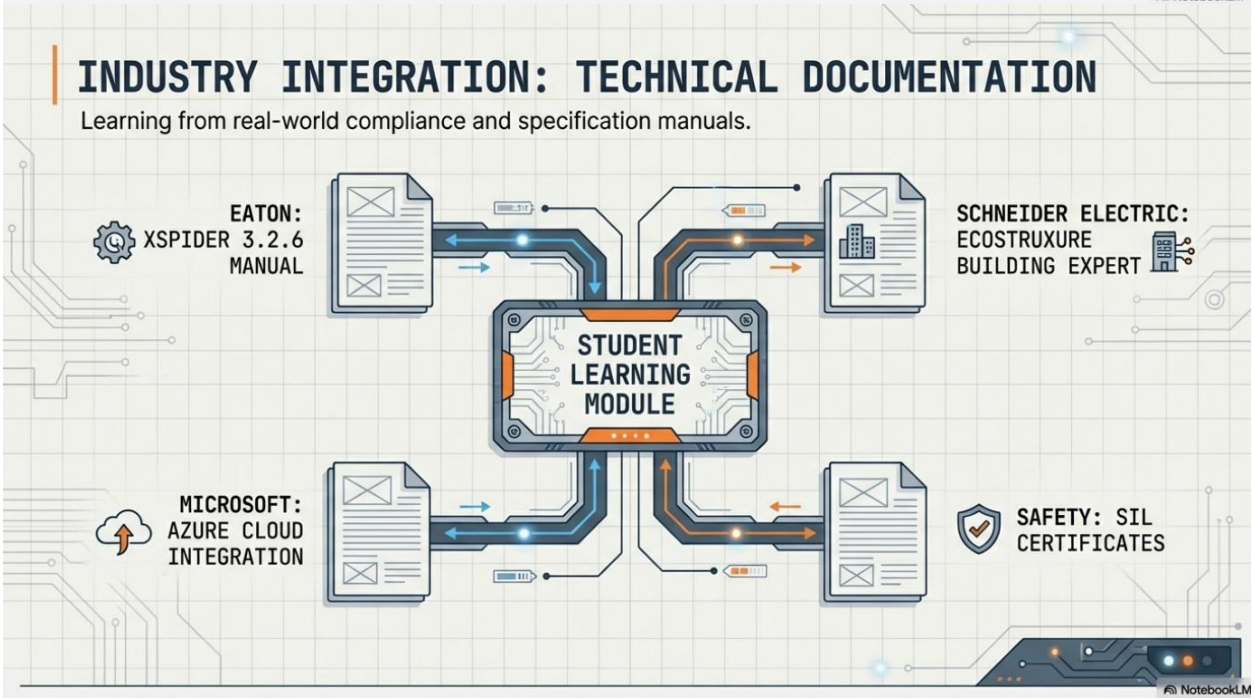

THE CAREER SYSTEMS ARCHITECTURE
From Assessment to Deployment: A Closed-Loop Educational Operating System.
INPUT LAYER
Psychometric & Cognitive Profiling (15FQ+, 3SAQ)
KERNEL LAYER
VBA Logigrams & Algorigrams (Automation Engine)
HARDWARE LAYER
Panel Wiring, Instrumentation & Safety Systems
CERTIFICATE
DATA FLOW
DATA FLOW
NotebookLM

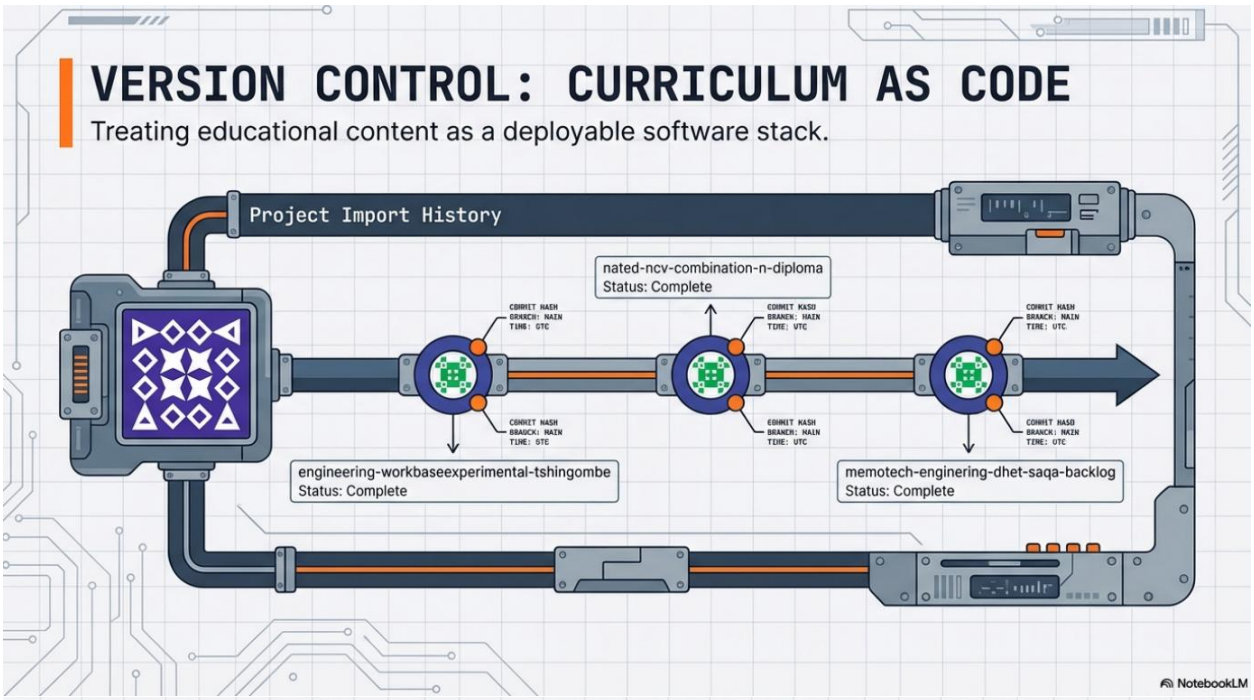

INPUT MODULE: PSYCHOMETRIC PROFILING
"Objective data to reduce bias and improve hiring decisions in multidisciplinary environments."
Personality Matrix (15FQ+)
Independence: 85%
Anxiety: 20%
Control: 65%
Cognitive Control Tasks
Stroop Test
550 ms
550 ms
AX-CPT
420 ms
420 ms
0
100
200
300
400
500
Reaction Time
Recruitment Tier: Cadet / Junior / Senior
Integrity Score: Pass
NotebookLM

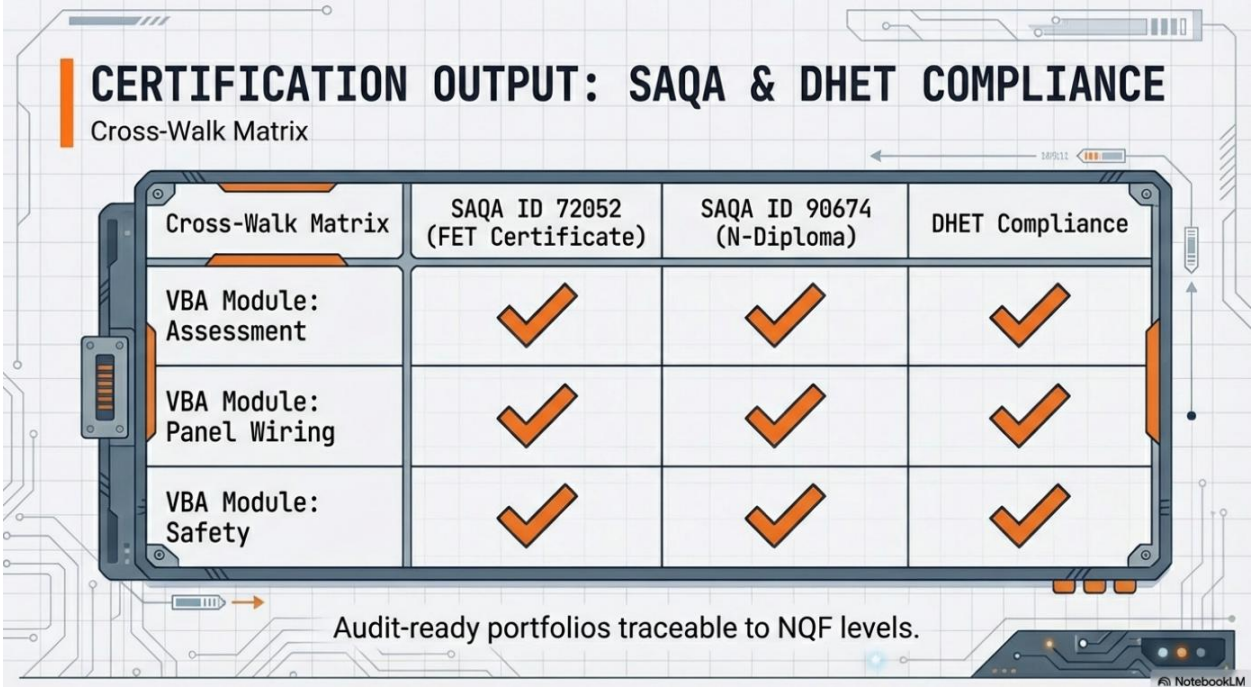

Industrial Systems Architecture
DIAGNOSTIC ENGINE: TRACKING CONCEPTUAL CHANGE
Objective measurement of cognitive shift through code-driven analysis
PRE-TEST MISCONCEPTION:
Formulaic Reasoning
VBA MODULE:
TrackConceptualChange
POST-TEST:
Embodied Understanding
METRICS & ANALYSIS
Metrics:
Explanation Quality (0-2 Scale)
SCORE
1.8
Wording Shifts:
Scientific Terminology Adoption
Velocity
Inertia
Momentum
Pre-Test
Post-Test
NotebookLM

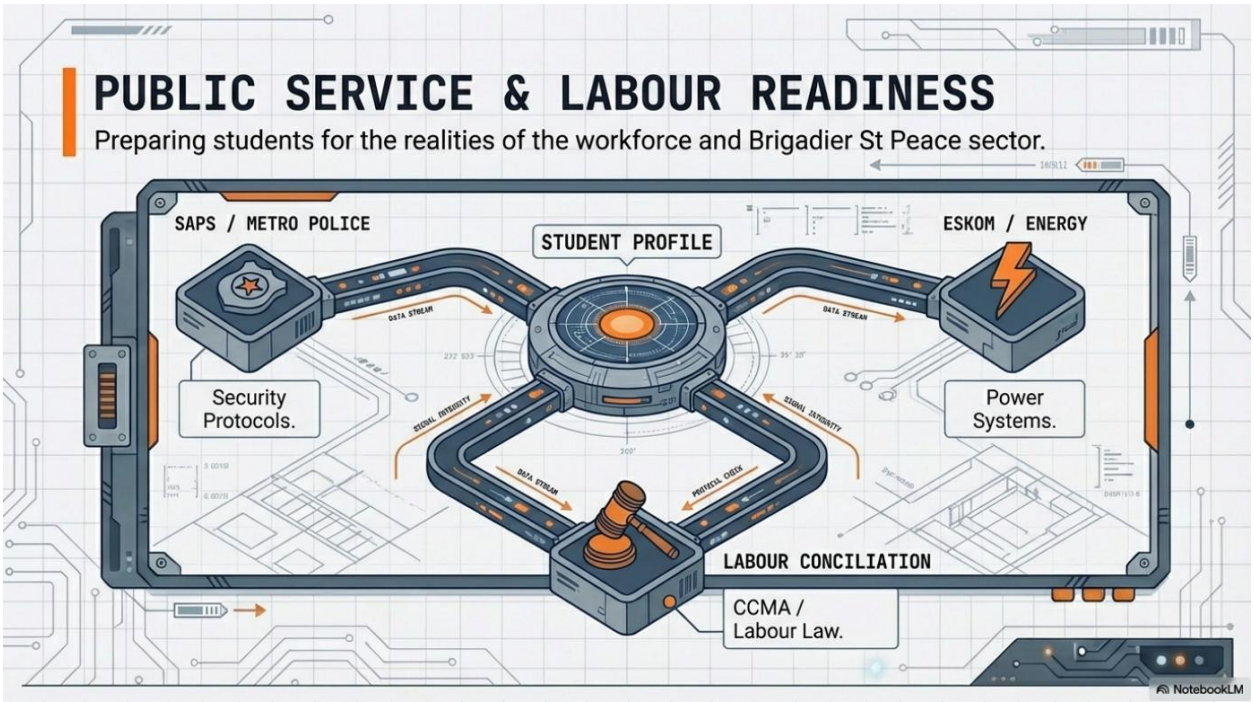

THE KERNEL: LOGIGRAMS & ALGORIGRAMS
Executable logic tracking learner autonomy.
Yes
Score >= 85?
No
Award Signal
Remedial Module
VBA MODULE: RouteCareerSignal
Sub RouteCareerSignal()
If score >= 85 Then
Call RouteAwardSignal
Else
Call RouteRemedialModule
End If
End Sub
NotebookLM

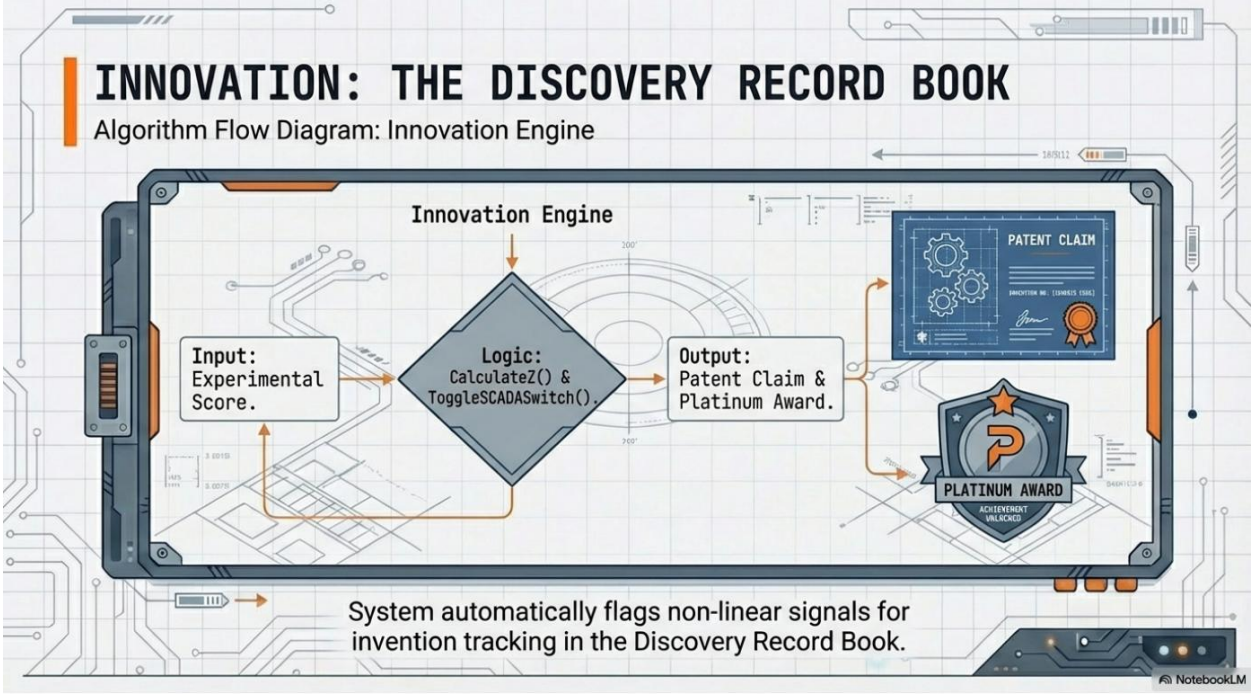

HARDWARE LAYER: PANEL-BASED ENGINEERING
Infrastructure:
Wiring Premises &
Industrial Electronics
Safety Protocol:
Brigadier St Peace
Control Room Review
Curriculum Map:
NATED N4-N6
Trade Theory
PPE Mandate:
Shoot Boots / Mask
Makarapan
NotebookLM

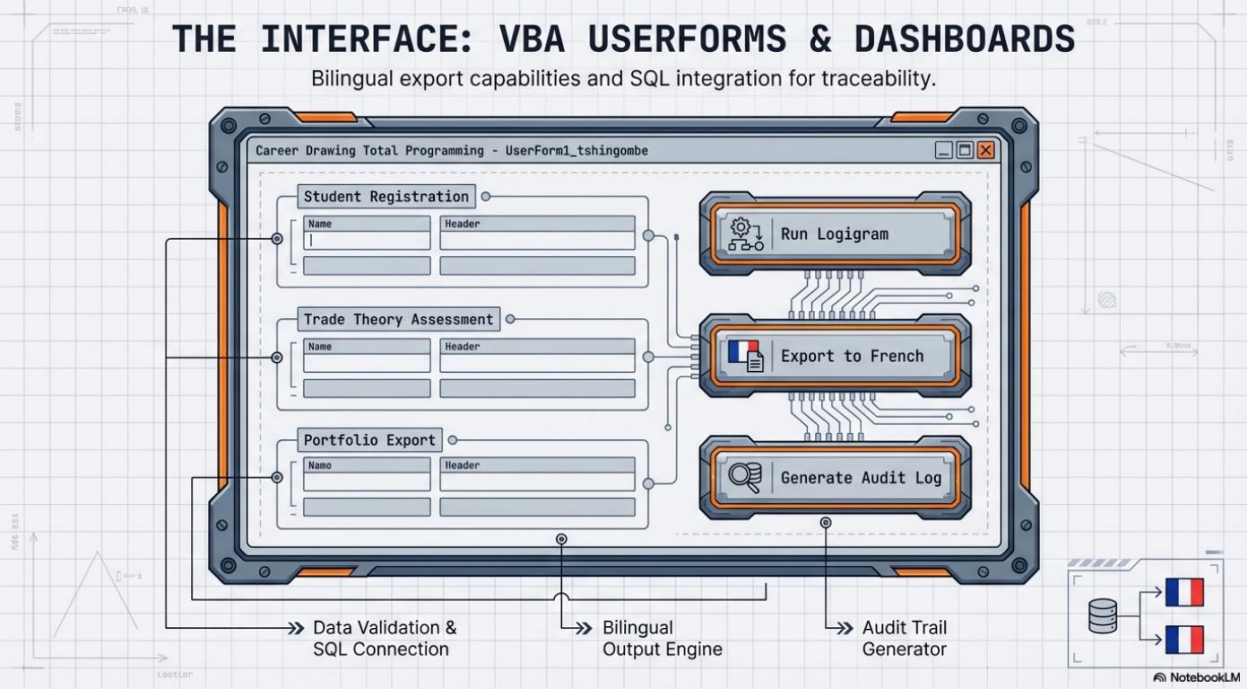

INDUSTRY INTEGRATION: TECHNICAL DOCUMENTATION
Learning from real-world compliance and specification manuals.
EATON:
XSPIDER 3.2.6
MANUAL
SCHNEIDER ELECTRIC:
ECOSTRUXURE
BUILDING EXPERT
STUDENT
LEARNING
MODULE
MICROSOFT:
AZURE CLOUD
INTEGRATION
SAFETY: SIL
CERTIFICATES
NotebookLM


VERSION CONTROL: CURRICULUM AS CODE
Treating educational content as a deployable software stack.
Project Import History
nated-ncv-combination-n-diploma
Status: Complete
engineering-workbaseexperimental-tshingombe
Status: Complete
memotech-enginering-dhet-saqa-backlog
Status: Complete
NotebookLM

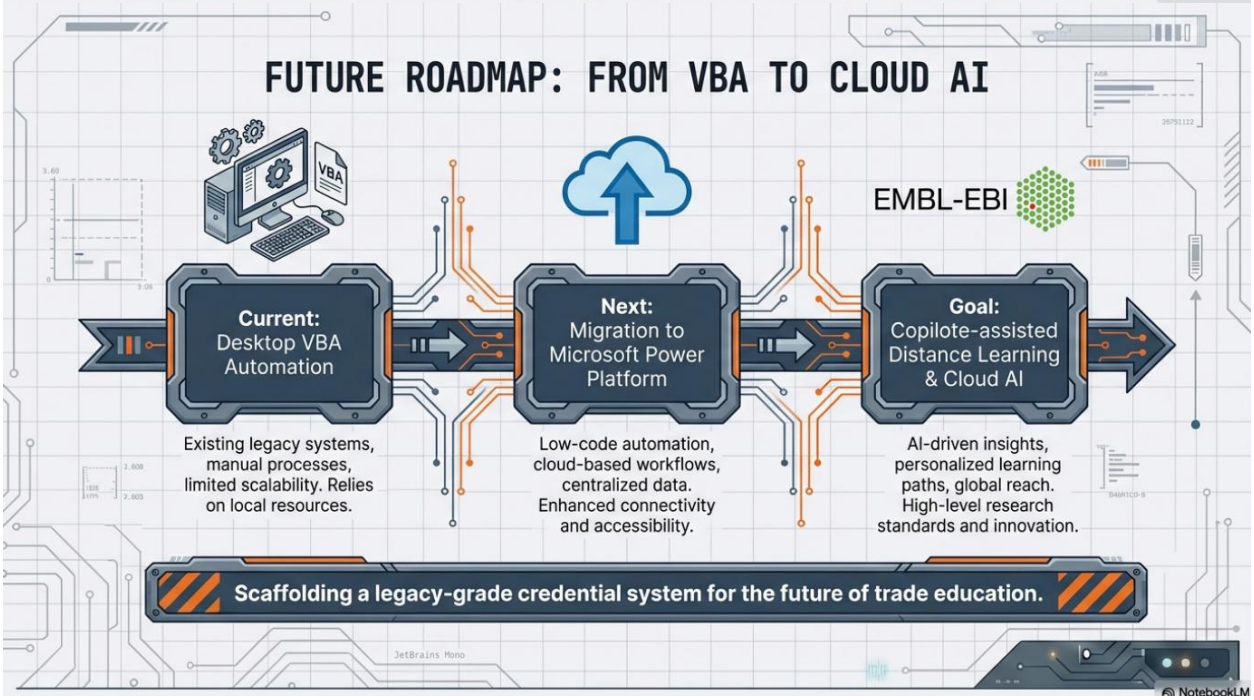

CERTIFICATION OUTPUT: SAQA & DHET COMPLIANCE
Cross-Walk Matrix
Cross-Walk Matrix
SAQA ID 72052 (FET Certificate)
SAQA ID 90674 (N-Diploma)
DHET Compliance
VBA Module: Assessment
VBA Module: Panel Wiring
VBA Module: Safety
Audit-ready portfolios traceable to NQF levels.
NotebookLM

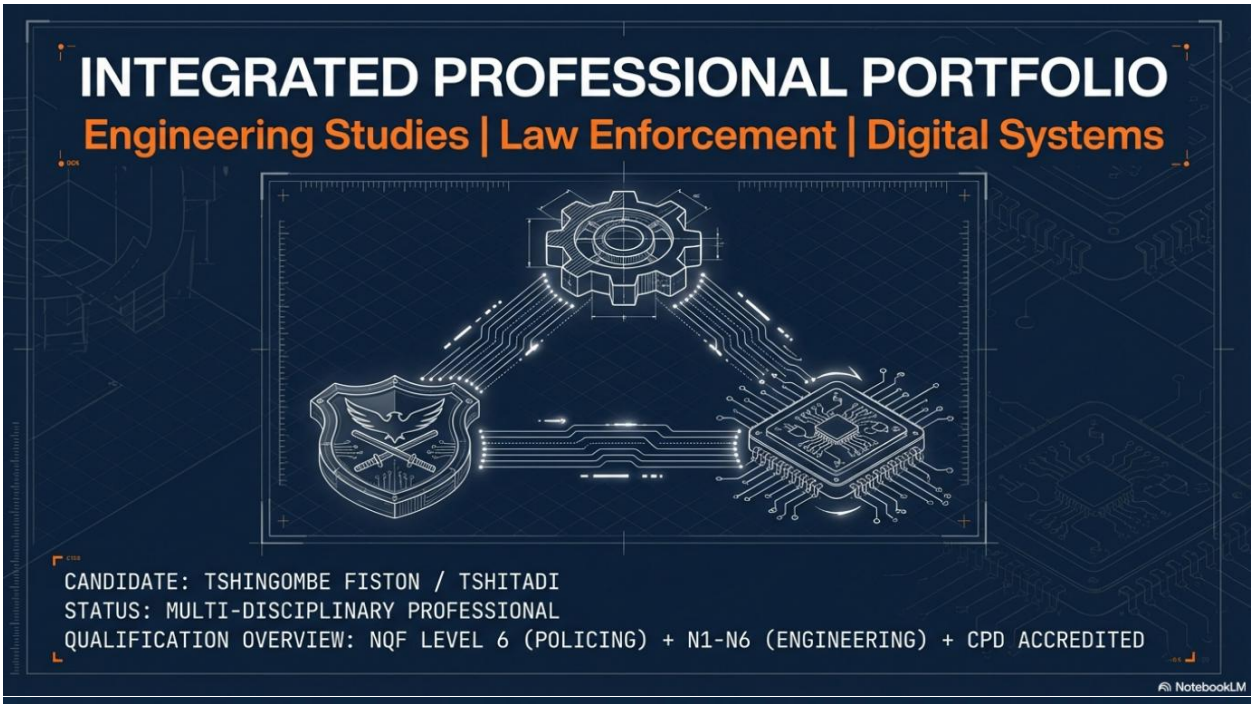

PUBLIC SERVICE & LABOUR READINESS
Preparing students for the realities of the workforce and Brigadier St Peace sector.
SAPS / METRO POLICE
STUDENT PROFILE
ESKOM / ENERGY
Security Protocols.
Power Systems.
LABOUR CONCILIATION
CCMA / Labour Law.
NotebookLM

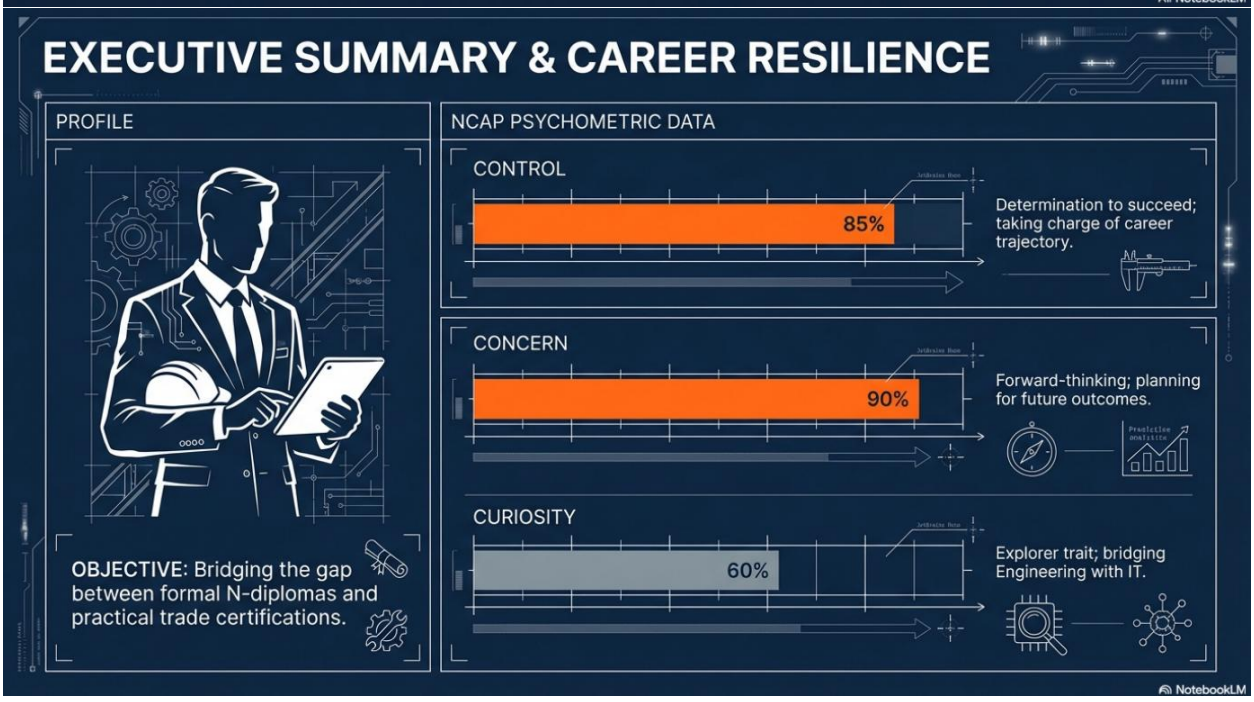

INNOVATION: THE DISCOVERY RECORD BOOK
Algorithm Flow Diagram: Innovation Engine
Innovation Engine
Input: Experimental Score.
Logic: CalculateZ() & ToggleSCADASwitch().
Output: Patent Claim & Platinum Award.
PATENT CLAIM
PLATINUM AWARD
System automatically flags non-linear signals for invention tracking in the Discovery Record Book.
NotebookLM

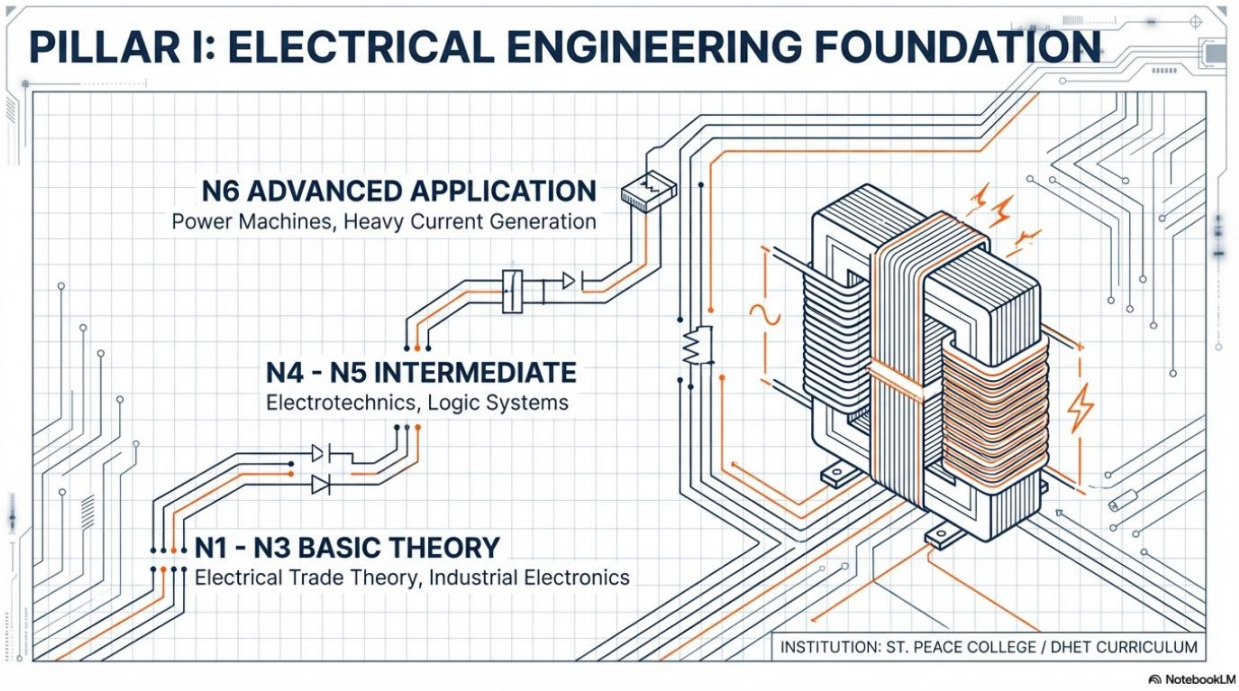

THE INTERFACE: VBA USERFORMS & DASHBOARDS
Bilingual export capabilities and SQL integration for traceability.
Career Drawing Total Programming - UserForm1_tshingombe
Student Registration
Name
Header
Trade Theory Assessment
Name
Header
Portfolio Export
Name
Header
Run Logigram
Export to French
Generate Audit Log
Data Validation & SQL Connection
Bilingual Output Engine
Audit Trail Generator
NotebookLM

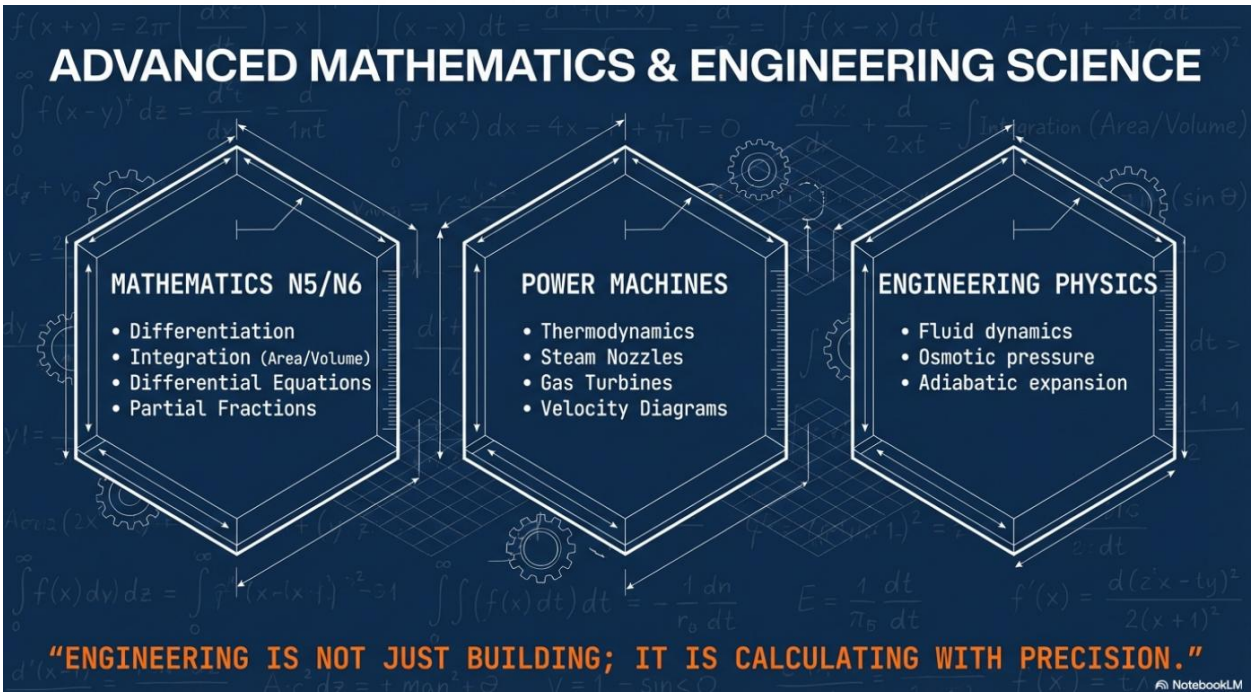
STRATEGIC ADVANTAGES
Why institutions should adopt the Total Programming Framework.
SCALABILITY
Modular plug-and-play architecture.
COMPLIANCE
Audit-ready "Portfolio Evidence" for DHET.
COST
Low TCO using standard Excel/VBA tools.
INNOVATION
Bilingual support and automated patent tracking.
PATENT
NotebookLM

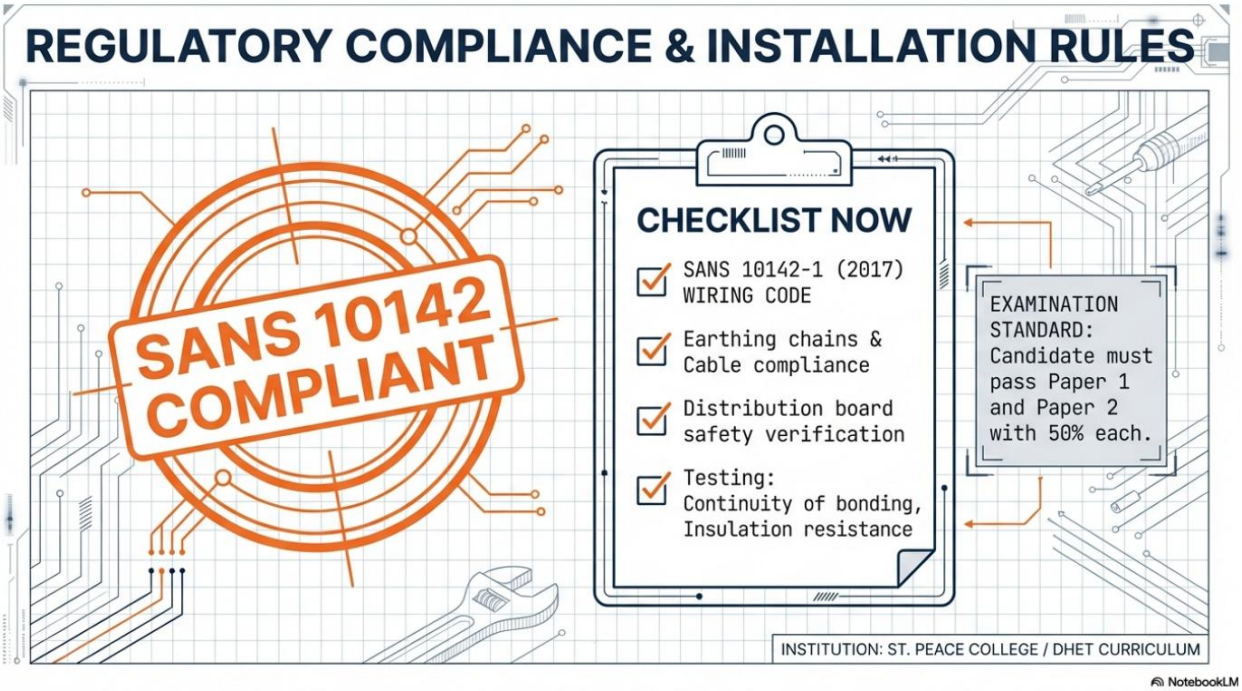

FUTURE ROADMAP: FROM VBA TO CLOUD AI
VBA
EMBL-EBI
Current:
Desktop VBA Automation
Next:
Migration to Microsoft Power Platform
Goal:
Copilote-assisted Distance Learning & Cloud AI
Existing legacy systems, manual processes, limited scalability. Relies on local resources.
Low-code automation, cloud-based workflows, centralized data. Enhanced connectivity and accessibility.
AI-driven insights, personalized learning paths, global reach. High-level research standards and innovation.
Scaffolding a legacy-grade credential system for the future of trade education.
NotebookLM

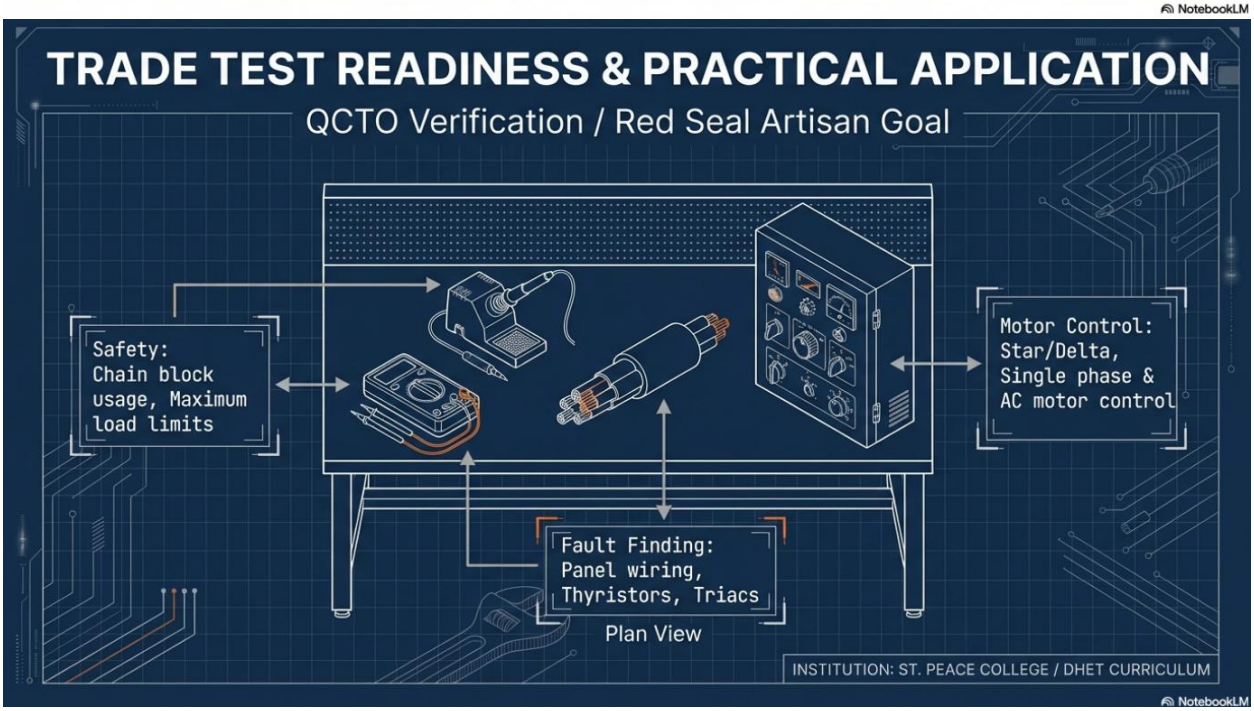

INTEGRATED PROFESSIONAL PORTFOLIO
Engineering Studies | Law Enforcement | Digital Systems
CANDIDATE: TSHINGOMBE FISTON / TSHITADI
STATUS: MULTI-DISCIPLINARY PROFESSIONAL
QUALIFICATION OVERVIEW: NQF LEVEL 6 (POLICING) + N1-N6 (ENGINEERING) + CPD ACCREDITED
NotebookLM


EXECUTIVE SUMMARY & CAREER RESILIENCE
PROFILE
OBJECTIVE: Bridging the gap between formal N-diplomas and practical trade certifications.
NCAP PSYCHOMETRIC DATA
CONTROL
85%
Determination to succeed; taking charge of career trajectory.
CONCERN
90%
Forward-thinking; planning for future outcomes.
CURIOSITY
60%
Explorer trait; bridging Engineering with IT.
NotebookLM

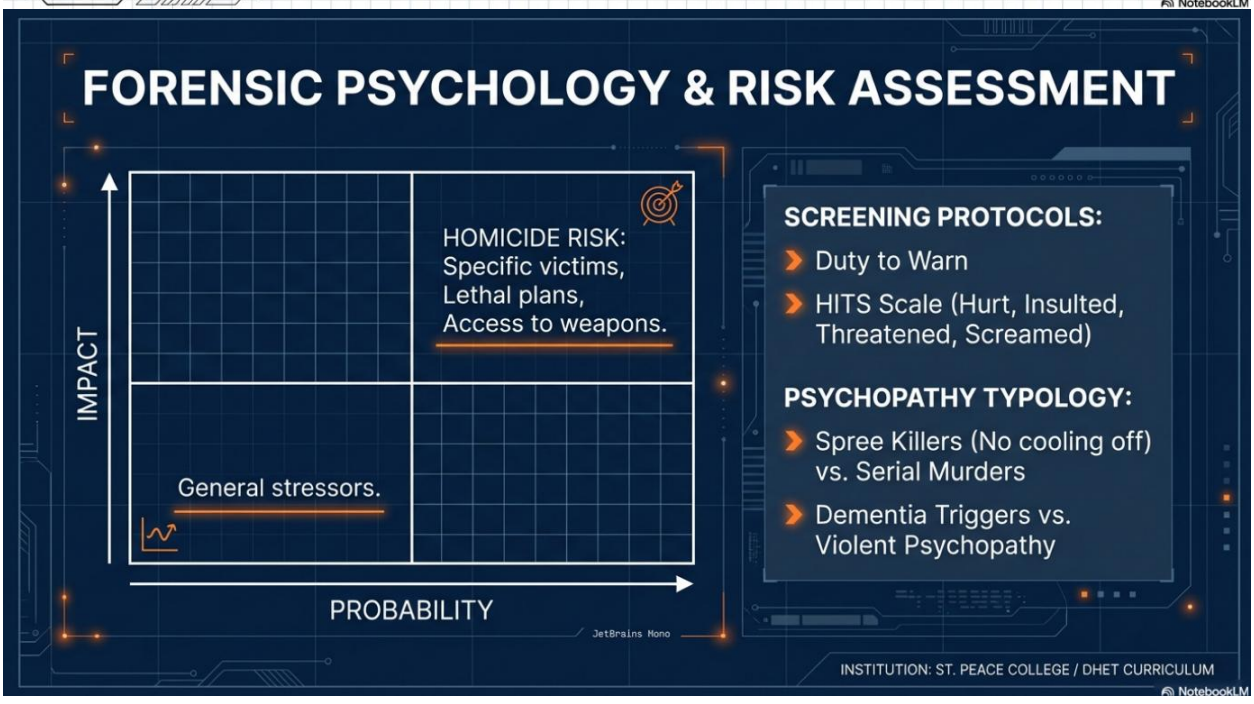

PILLAR I: ELECTRICAL ENGINEERING FOUNDATION
N6 ADVANCED APPLICATION
Power Machines, Heavy Current Generation
N4 - N5 INTERMEDIATE
Electrotechnics, Logic Systems
N1 - N3 BASIC THEORY
Electrical Trade Theory, Industrial Electronics
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM

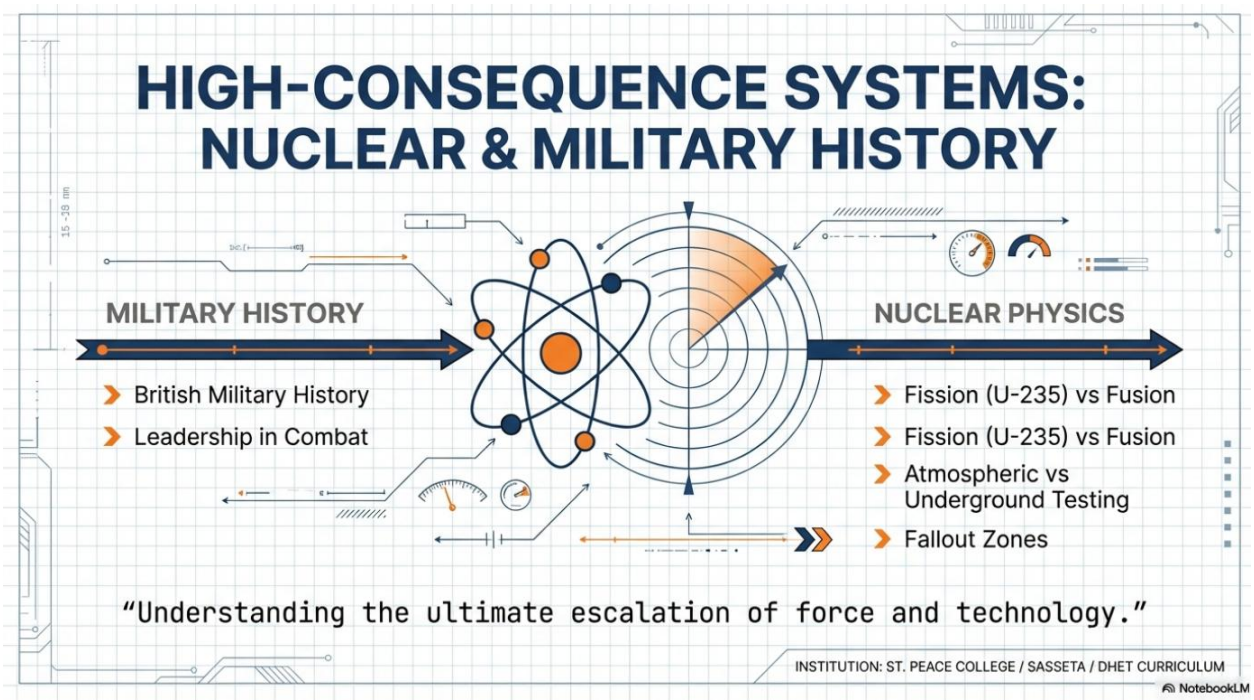

ADVANCED MATHEMATICS & ENGINEERING SCIENCE
MATHEMATICS N5/N6
• Differentiation
• Integration (Area/Volume)
• Differential Equations
• Partial Fractions
POWER MACHINES
• Thermodynamics
• Steam Nozzles
• Gas Turbines
• Velocity Diagrams
ENGINEERING PHYSICS
• Fluid dynamics
• Osmotic pressure
• Adiabatic expansion
"ENGINEERING IS NOT JUST BUILDING; IT IS CALCULATING WITH PRECISION."
NotebookLM

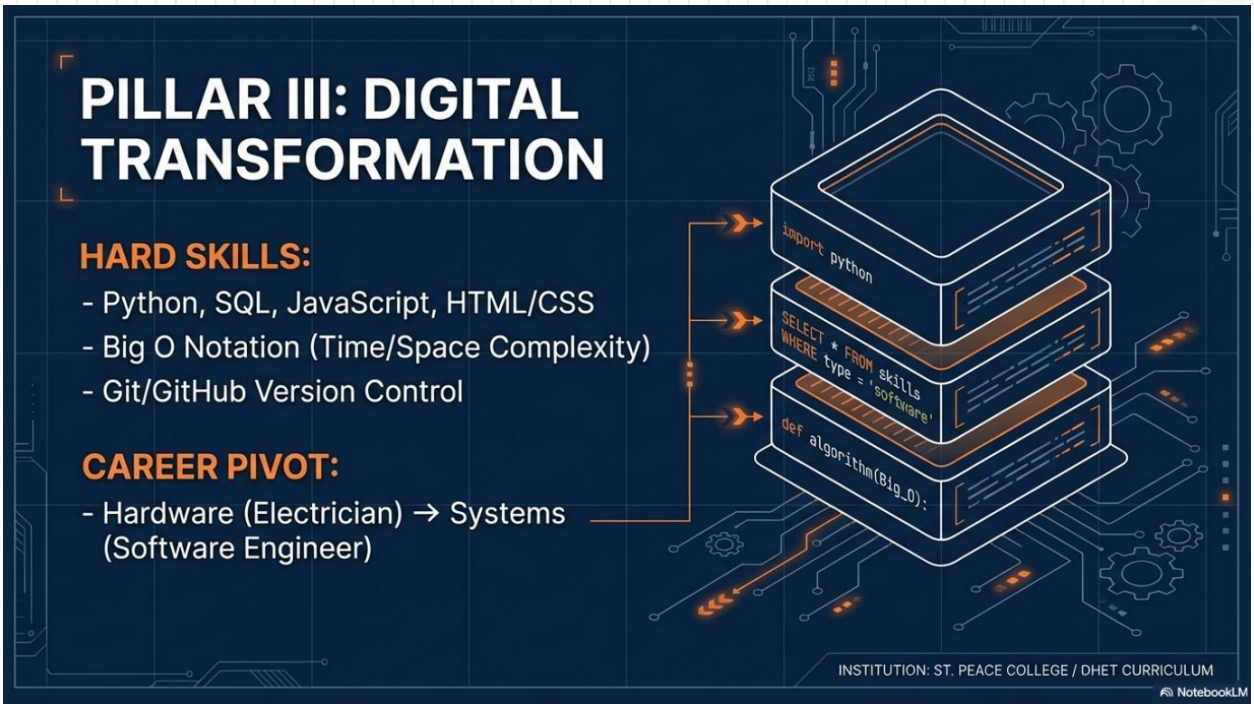

REGULATORY COMPLIANCE & INSTALLATION RULES
SANS 10142 COMPLIANT
CHECKLIST NOW
SANS 10142-1 (2017) WIRING CODE
Earthing chains & Cable compliance
Distribution board safety verification
Testing: Continuity of bonding, Insulation resistance
EXAMINATION STANDARD: Candidate must pass Paper 1 and Paper 2 with 50% each.
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM

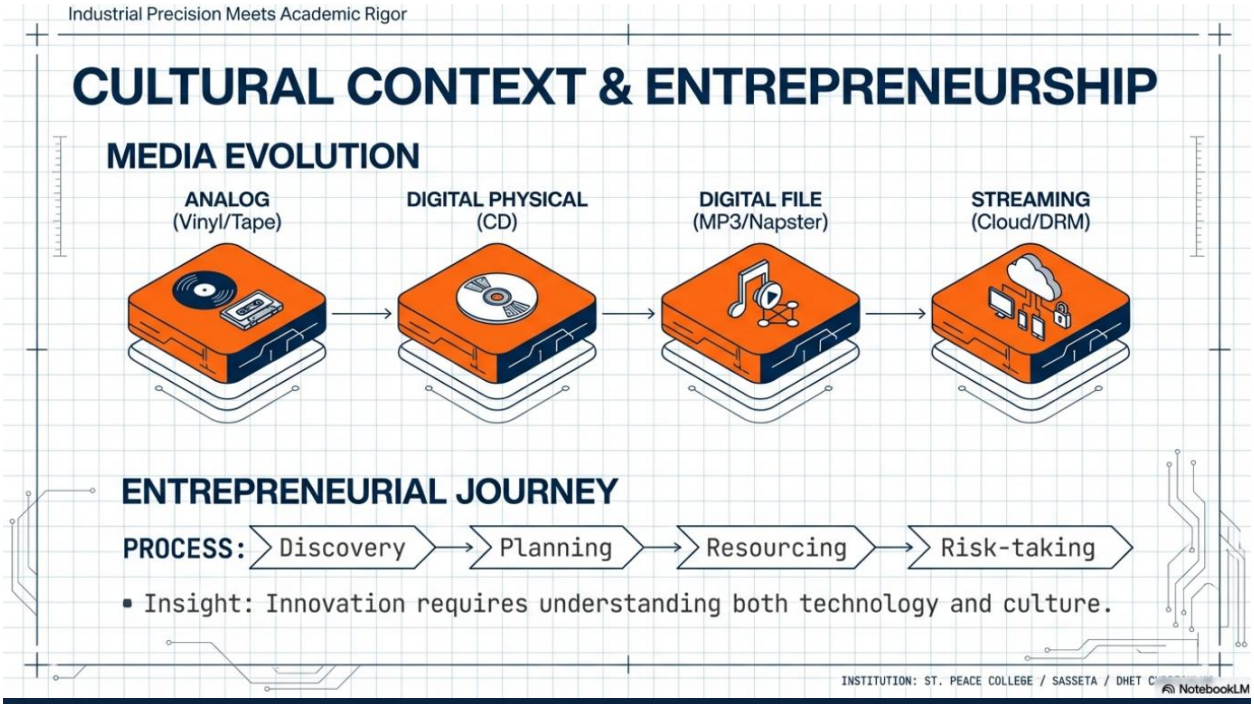

TRADE TEST READINESS & PRACTICAL APPLICATION
QCTO Verification / Red Seal Artisan Goal
Safety: Chain block usage, Maximum load limits
Motor Control: Star/Delta, Single phase & AC motor control
Fault Finding: Panel wiring, Thyristors, Triacs
Plan View
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM

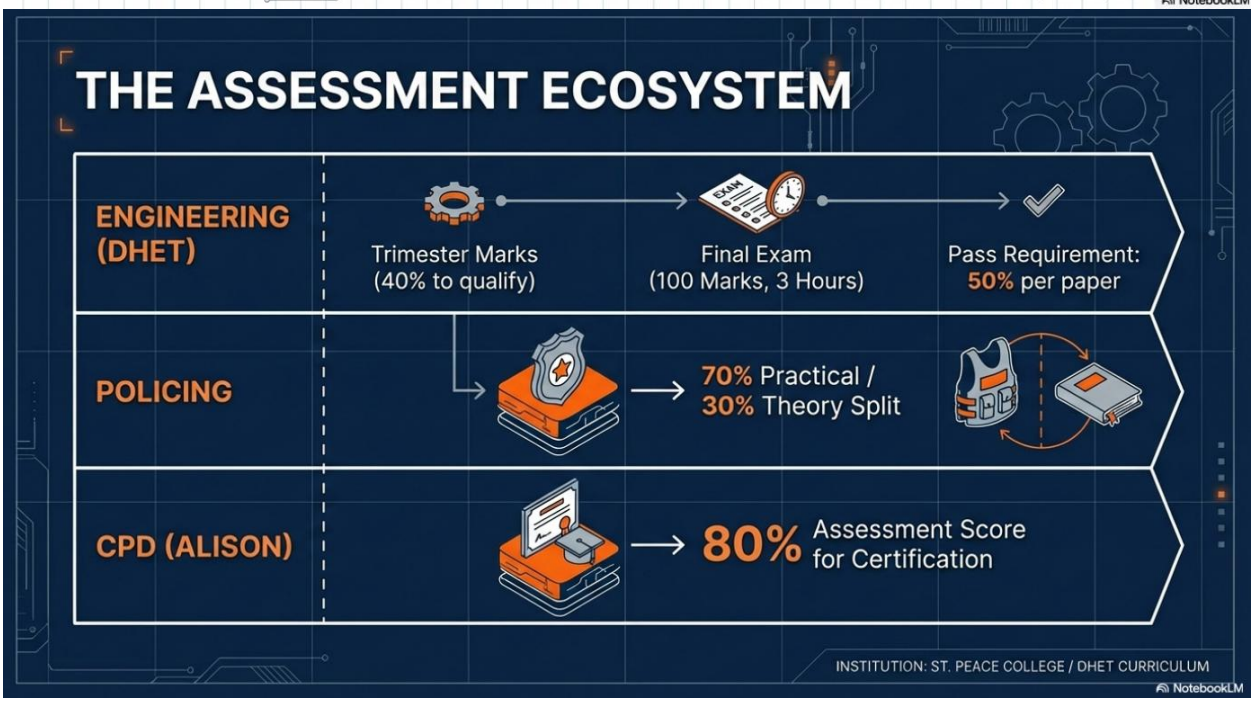
PILLAR II: POLICING & CRIMINOLOGY
Qualification: National Diploma in Policing (NQF Level 6)
Institution: St. Peace College / SASSETA
- Crime Scene Investigation (CSI)
- Forensics: Fingerprint & DNA Analysis
- Surveillance Techniques
- Legal Administration & Traffic Law
INSTITUTION: ST. PEACE COLLEGE / SASSETA
NotebookLM

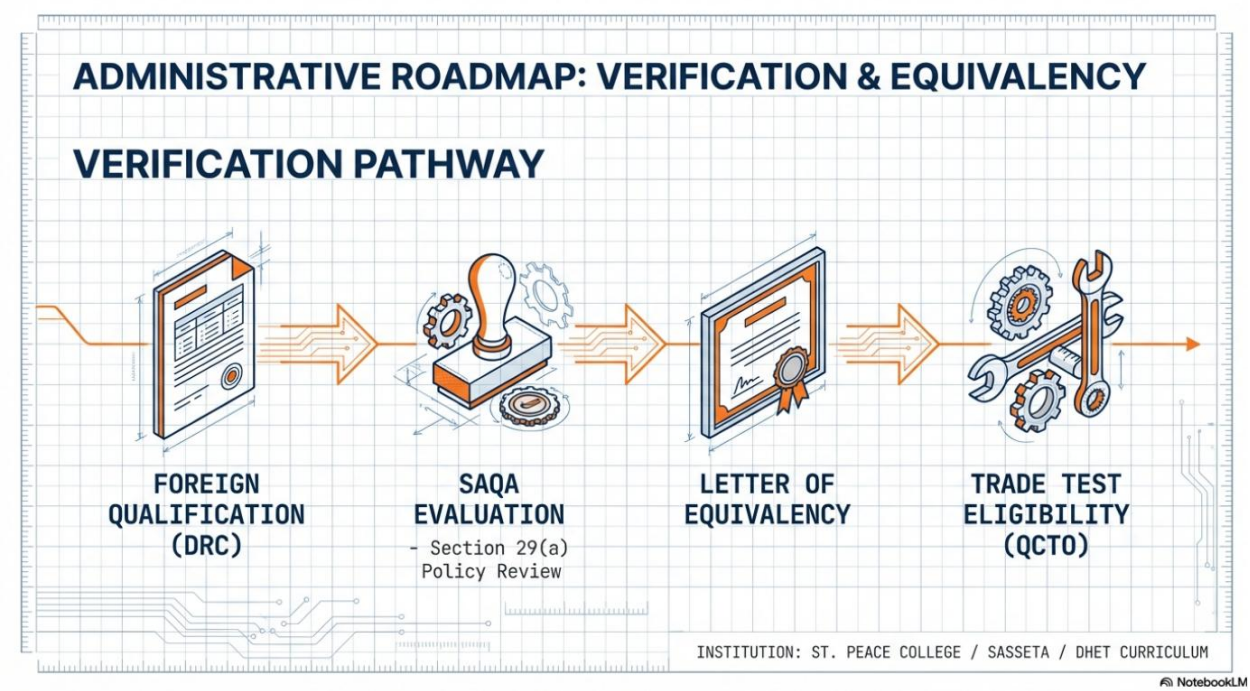

FORENSIC PSYCHOLOGY & RISK ASSESSMENT
IMPACT
PROBABILITY
HOMICIDE RISK:
Specific victims,
Lethal plans,
Access to weapons.
General stressors.
SCREENING PROTOCOLS:
Duty to Warn
HITS Scale (Hurt, Insulted, Threatened, Screamed)
PSYCHOPATHY TYPOLOGY:
Spree Killers (No cooling off) vs. Serial Murders
Dementia Triggers vs. Violent Psychopathy
JetBrains Mono
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM

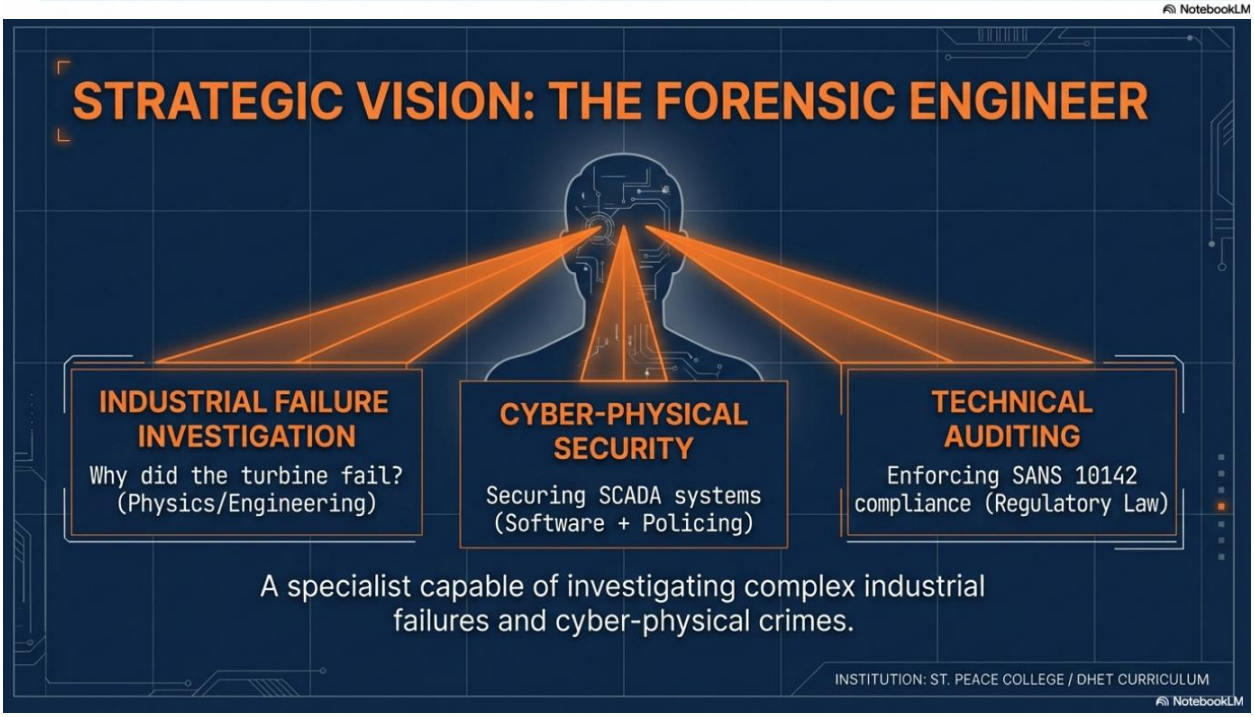

HIGH-CONSEQUENCE SYSTEMS:
NUCLEAR & MILITARY HISTORY
MILITARY HISTORY
British Military History
Leadership in Combat
NUCLEAR PHYSICS
Fission (U-235) vs Fusion
Fission (U-235) vs Fusion
Atmospheric vs Underground Testing
Fallout Zones
"Understanding the ultimate escalation of force and technology."
INSTITUTION: ST. PEACE COLLEGE / SASSETA / DHET CURRICULUM
NotebookLM


PILLAR III: DIGITAL TRANSFORMATION
HARD SKILLS:
- Python, SQL, JavaScript, HTML/CSS
- Big O Notation (Time/Space Complexity)
- Git/GitHub Version Control
CAREER PIVOT:
- Hardware (Electrician) → Systems (Software Engineer)
import python
SELECT * FROM skills WHERE type = 'Software'
def algorithm(Big_O):
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM


Industrial Precision Meets Academic Rigor
CULTURAL CONTEXT & ENTREPRENEURSHIP
MEDIA EVOLUTION
ANALOG
(Vinyl/Tape)
DIGITAL PHYSICAL
(CD)
DIGITAL FILE
(MP3/Napster)
STREAMING
(Cloud/DRM)
ENTREPRENEURIAL JOURNEY
PROCESS: Discovery → Planning → Resourcing → Risk-taking
• Insight: Innovation requires understanding both technology and culture.
INSTITUTION: ST. PEACE COLLEGE / SASSETA / DHET C
NotebookLM


THE ASSESSMENT ECOSYSTEM
ENGINEERING (DHET)
Trimester Marks
(40% to qualify)
EXAM
Final Exam
(100 Marks, 3 Hours)
Pass Requirement:
50% per paper
POLICING
70% Practical /
30% Theory Split
CPD (ALISON)
80% Assessment Score
for Certification
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
NotebookLM


ADMINISTRATIVE ROADMAP: VERIFICATION & EQUIVALENCY
VERIFICATION PATHWAY
FOREIGN QUALIFICATION (DRC)
SAQA EVALUATION
- Section 29(a) Policy Review
LETTER OF EQUIVALENCY
TRADE TEST ELIGIBILITY (QCTO)
INSTITUTION: ST. PEACE COLLEGE / SASSETA / DHET CURRICULUM
NotebookLM


STRATEGIC VISION: THE FORENSIC ENGINEER
INDUSTRIAL FAILURE INVESTIGATION
Why did the turbine fail? (Physics/Engineering)
CYBER-PHYSICAL SECURITY
Securing SCADA systems (Software + Policing)
TECHNICAL AUDITING
Enforcing SANS 10142 compliance (Regulatory Law)
A specialist capable of investigating complex industrial failures and cyber-physical crimes.
INSTITUTION: ST. PEACE COLLEGE / DHET CURRICULUM
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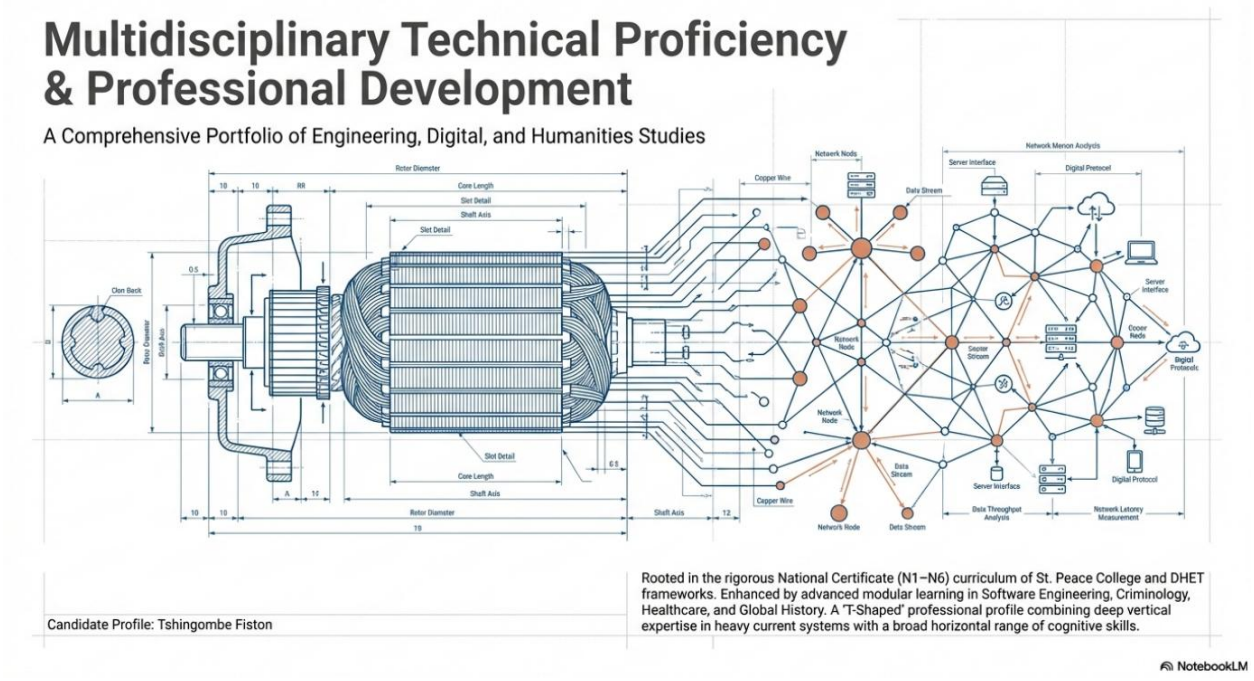
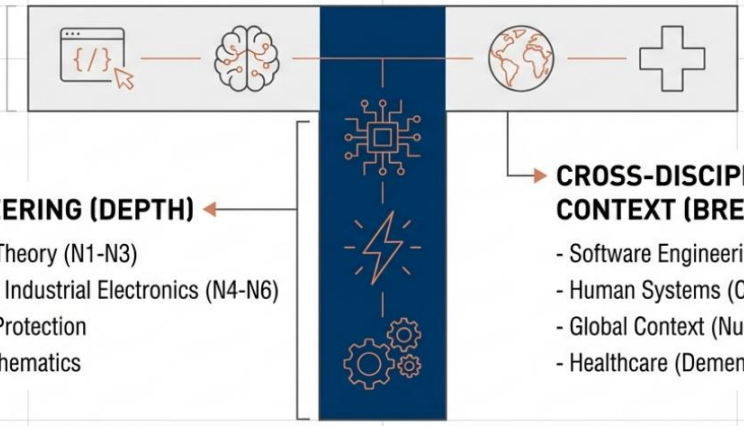
ACTION PLAN & NEXT STEPS
[PENDING] ENGINEERING: Finalize N6 Certificate & Diploma Application
[IN PROGRESS] ADMIN: Resolve SAQA verification for foreign documents
[IN PROGRESS] PRACTICAL: Complete Trade Test Logbook (Motor Control)
[ONGOING] CPD: Continue Software Engineering Portfolios (GitHub)
STATUS: BUILDING A RESILIENT, MULTI-DISCIPLINARY CAREER.


Multidisciplinary Technical Proficiency & Professional Development
A Comprehensive Portfolio of Engineering, Digital, and Humanities Studies
Candidate Profile: Tshingombe Fiston
Rooted in the rigorous National Certificate (N1–N6) curriculum of St. Peace College and DHET frameworks. Enhanced by advanced modular learning in Software Engineering, Criminology, Healthcare, and Global History. A 'T-Shaped' professional profile combining deep vertical expertise in heavy current systems with a broad horizontal range of cognitive skills.
NotebookLM

THE T-SHAPED PROFESSIONAL STRATEGY



CORE ENGINEERING (DEPTH)

- Electrical Trade Theory (N1-N3)
- Heavy Current & Industrial Electronics (N4-N6)
- Fault Finding & Protection
- Engineering Mathematics

CROSS-DISCIPLINARY CONTEXT (BREADTH)

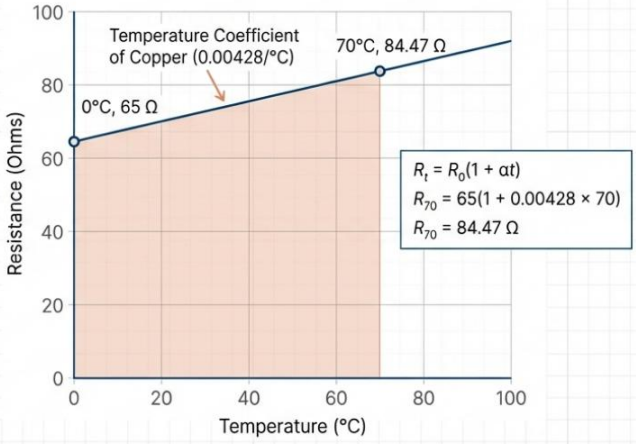
- Software Engineering (Python/SQL)
- Human Systems (Criminology/Psychology)
- Global Context (Nuclear/Military History)
- Healthcare (Dementia Care)

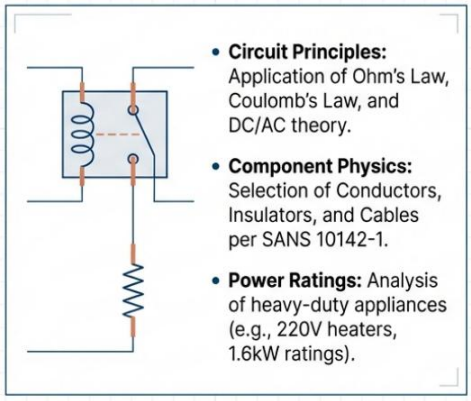
Insight: True professional resilience requires a specialized technical spine supported by a diverse cognitive crossbar. Validated by SAQA and QCTO alignment.

NotebookLM

Theoretical Foundations: Electrical Engineering (N1–N3)

Mastery of Circuit Principles and Component Physics





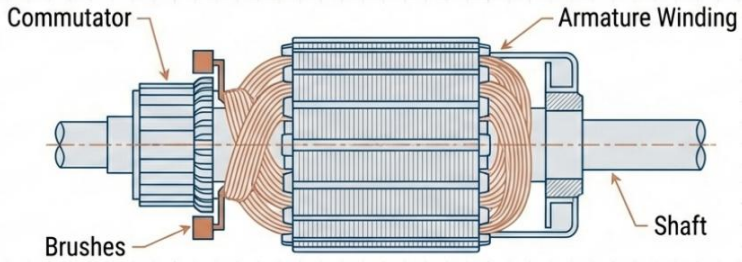
- **Circuit Principles:** Application of Ohm's Law, Coulomb's Law, and DC/AC theory.
- **Component Physics:** Selection of Conductors, Insulators, and Cables per SANS 10142-1.
- **Power Ratings:** Analysis of heavy-duty appliances (e.g., 220V heaters, 1.6kW ratings).

NotebookLM

Advanced Systems: Heavy Current & Protection (N4–N6)

Key Competencies

- **Machines & Motors:** Synchronous motors, 3-Phase Induction motors, and DC Generators.
- **Transformers:** Leakage flux reduction and construction dynamics.
- **Protection Systems:** Switchgear implementation and overload protection.



Fault Finding Logic

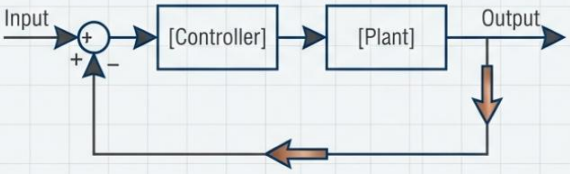
Symptom Identification → Isolation (Lock-out) → Continuity Test → Insulation Resistance Test → Diagnosis

Methodical diagnosis of mechanical vs. electrical faults (e.g., conductor joints vs. insulation failure).

NotebookLM

Mathematical Modeling & Control Systems

Mathematics N5/N6: Application of differentiation, integration, and limits to solve complex engineering problems.
Control Systems: Analysis of transient vs. steady-state response. Open Loop vs. Closed Loop architectures.
Engineering Physics: Thermodynamics (Specific heat capacity, isentropic dryness) and Fluid Dynamics (Bernoulli's principles).



$$\int e^{-3x}\cos(3x)\,dx$$

Utilizing Transfer Functions to model the relationship between input and output in automated industrial systems.

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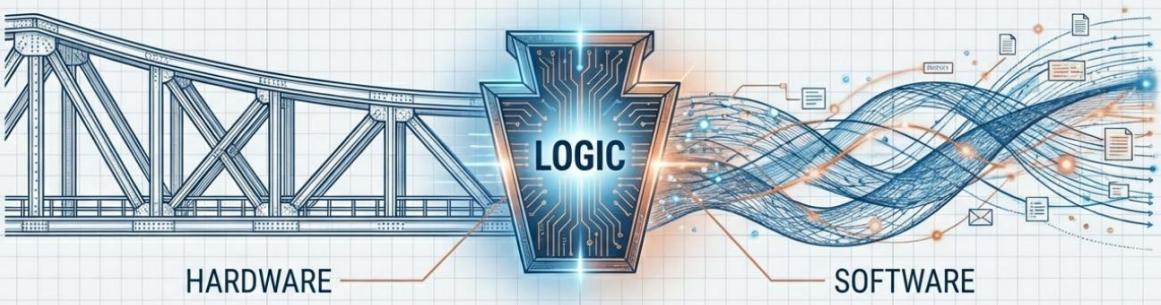
The Digital Bridge: Hardware to Software Engineering



Electrical Engineering	Software Engineering
- Physical Constraints (Voltage, Heat) - Component Manufacturing - Linear & Non-Linear Circuits	- Logical Constraints (Memory, Time) - SDLC (Software Development Life Cycle) - Object-Oriented Principles (Abstraction, Encapsulation)

Algorithmic Efficiency (Big O):

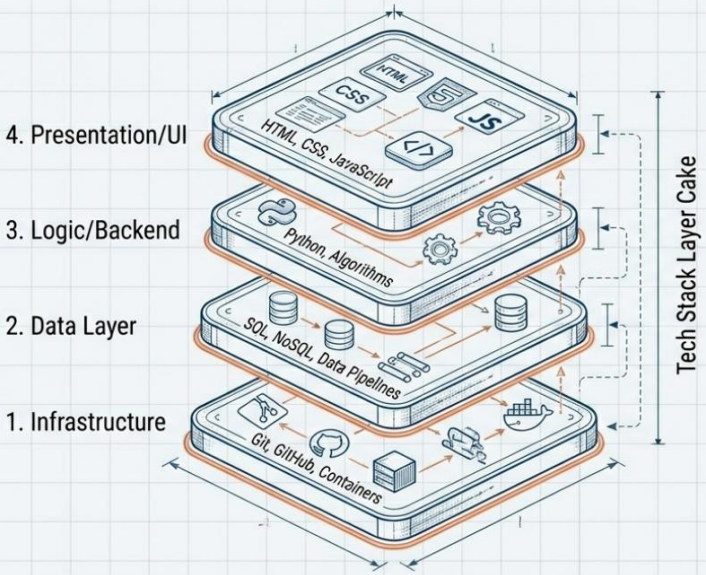
$O(1)$: Constant Time

$O(n)$: Linear Time

$O(n^2)$: Quadratic Time

NotebookLM

The Modern Tech Stack & Architecture



Data Engineering:
Handling unstructured data pipeline architecture.

Bioinformatics Intersection:
Applying Machine Learning (Supervised/Unsupervised) and Network Analysis to biological systems.

Career Trajectory:
Junior -> Senior -> Principal Engineer.

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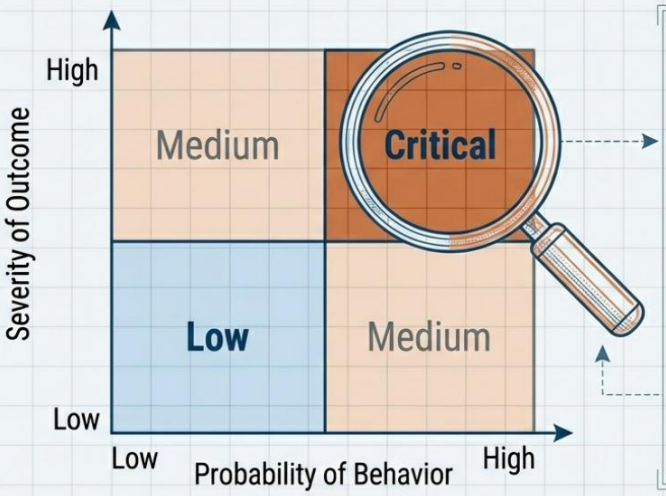
“Human Systems Analysis: Criminology & Psychology” in DIN Pro

Applying analytical rigor to human behavior and risk.

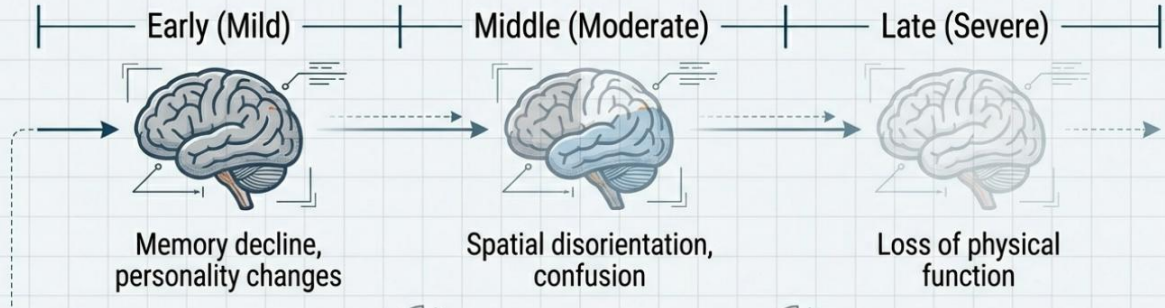


- **Homicide Risk Evaluation:** Screening for ‘Identifiable Victims,” ‘Rational Plans,” and “Access to Weapons.”
- **Psychopathy Assessment:** Utilizing the PCL-R (Psychopathy Checklist) to distinguish between Cluster B personality disorders and violent intent.
- **Data-Driven Tools:** HITS Scale (Hurt, Insult, Threaten, Scream) and ODARA (Ontario Domestic Assault Risk Assessment).

NotebookLM

Healthcare Perspectives: Dementia & Cognitive Systems

Progression of Alzheimer's Disease



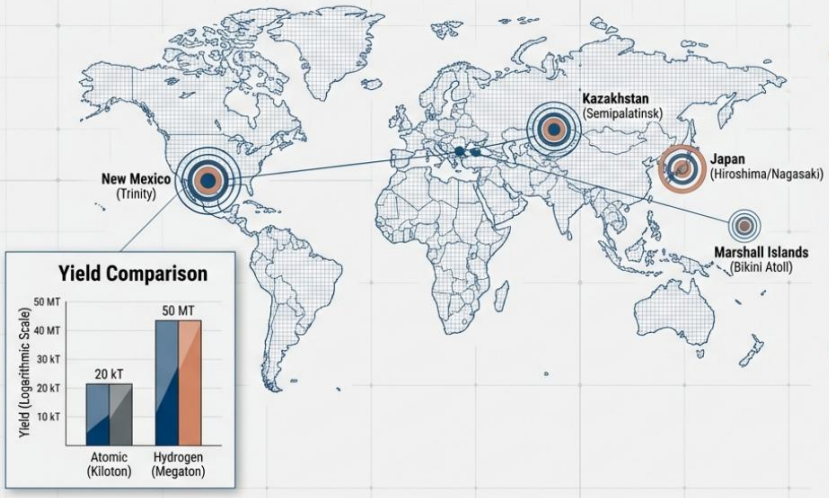
Care Strategy

- **Pathology:** Understanding the biological breakdown of memory systems.
- **Communication:** Validating feelings versus correcting facts (“Soft Approach”).
- **Behavior Management:** Redirection techniques for psychomotor behaviors like wandering.

NotebookLM

Global Context: Military History & Nuclear Science

Exploring the intersection of physics, historical events, and environmental legacy.



- **Physics of War:** The escalation from Fission (Atomic) to Fusion (Thermonuclear) weaponry.
- **Historical Impact:** The Manhattan Project, the Trinity Test (1945), and the Cold War Arms Race.
- **Environmental Legacy:** Atmospheric vs. Underground testing (Strontium-90 fallout) and the Non-Proliferation Treaty (NPT).

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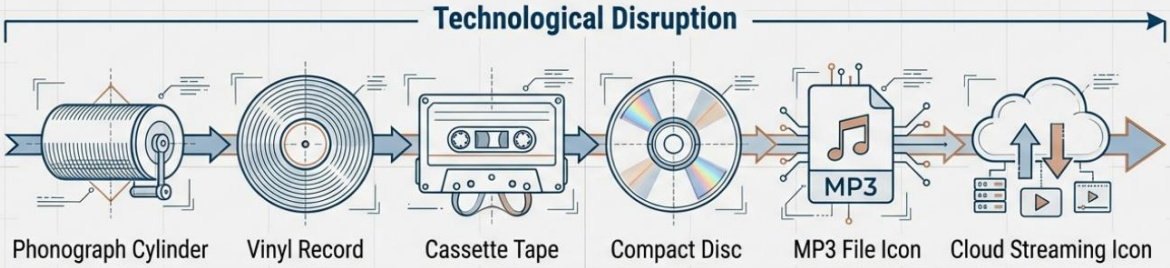
Media Technology & Industry Evolution

Intersection of Engineering, Commerce, and Law

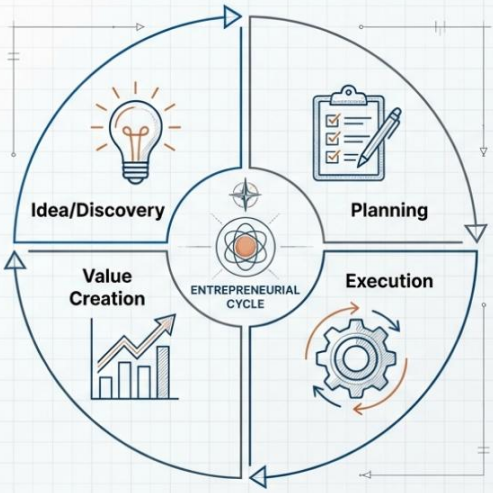


Phonograph Cylinder | Vinyl Record | Cassette Tape | Compact Disc | MP3 File Icon | Cloud Streaming Icon

- **Analog Era:** Edison's phonograph and Marconi's radio waves.
- **Digital Disruption:** The shift to MP3s, Napster, and the collapse of physical sales.
- **Modern Context:** Digital Rights Management (DRM) and the 'Long Tail' economics of streaming.
- **Legal Framework:** Copyright and the Fairness Doctrine.

NotebookLM

Entrepreneurship & Value Creation



- **Entrepreneurial Typologies:** Distinguishing between Innovative, Replicative, Opportunity, and Necessity Entrepreneurs
- **Opportunity Recognition:** The journey from the "seed of an idea" to market realization
- **Psychology:** Internal Locus of Control and resilience in risk-taking

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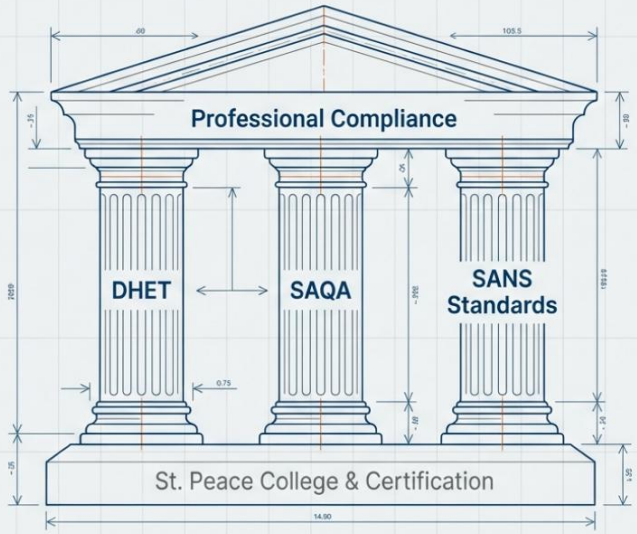
Institutional Governance, Safety & Compliance



- **DHET & SAQA:** Alignment with the Department of Higher Education and South African Qualifications Authority.
- **SANS 10142-1:** Strict adherence to the Wiring of Premises code and safety standards.
- **Occupational Safety:** OHS protocols for hand tools, lock-out procedures, and chain block limits.

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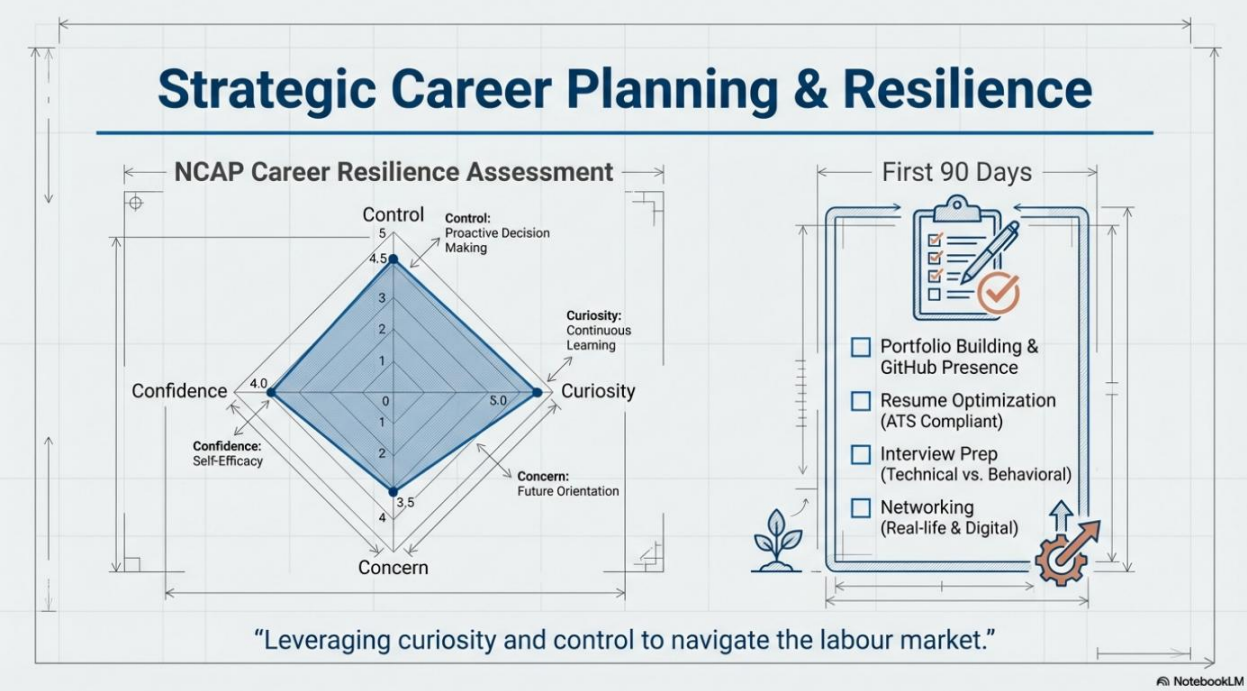
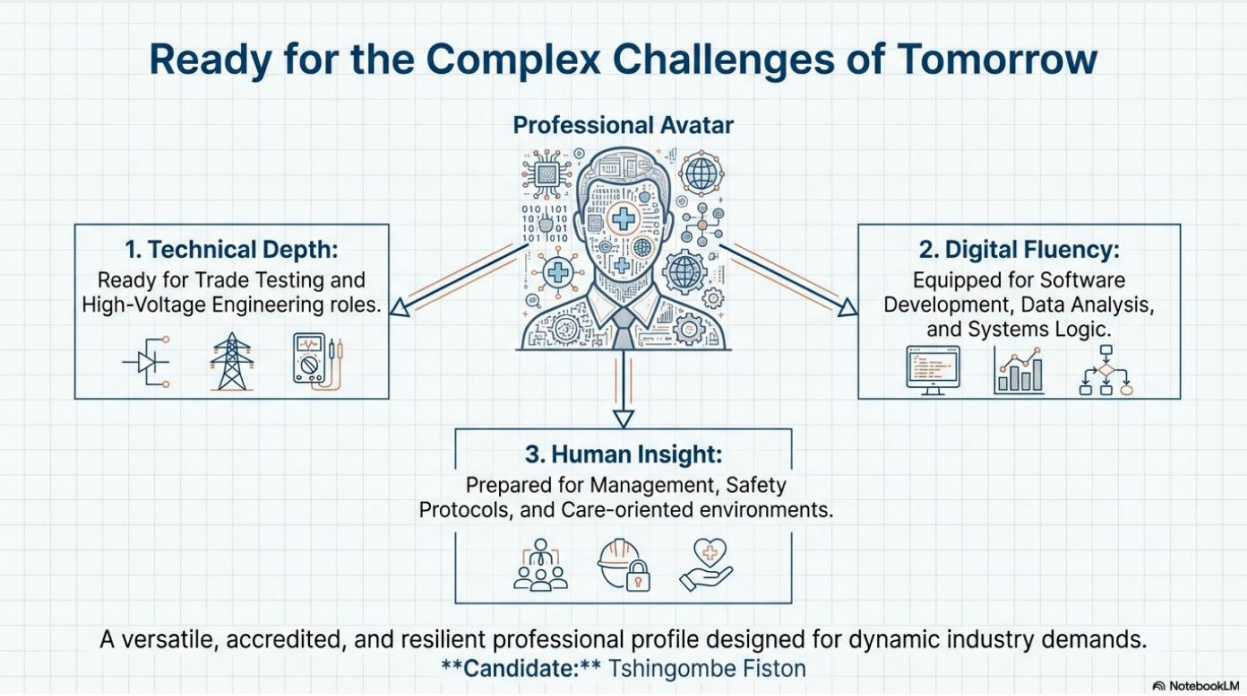

Strategic Career Planning & Resilience
NCAP Career Resilience Assessment
Control
Control: Proactive Decision Making
Curiosity: Continuous Learning
Curiosity
Confidence
Confidence: Self-Efficacy
Concern: Future Orientation
Concern
5
4.5
3
2
1
0
1
2
3.5
4
4.0
5.0
First 90 Days
Portfolio Building & GitHub Presence
Resume Optimization (ATS Compliant)
Interview Prep (Technical vs. Behavioral)
Networking (Real-life & Digital)
"Leveraging curiosity and control to navigate the labour market."
NotebookLM


Ready for the Complex Challenges of Tomorrow
Professional Avatar
1. Technical Depth:
Ready for Trade Testing and High-Voltage Engineering roles.
2. Digital Fluency:
Equipped for Software Development, Data Analysis, and Systems Logic.
3. Human Insight:
Prepared for Management, Safety Protocols, and Care-oriented environments.
A versatile, accredited, and resilient professional profile designed for dynamic industry demands.
Candidate: Tshingombe Fiston
NotebookLM

Integrated Engineering Pathways

Bridging Theory, Technology, and Industry

A Strategic Framework for NATED/NCV Skills Development in the South African Energy Sector

Prepared for DHET, Industry Partners, and Academic Stakeholders

Integrated Engineering Pathways

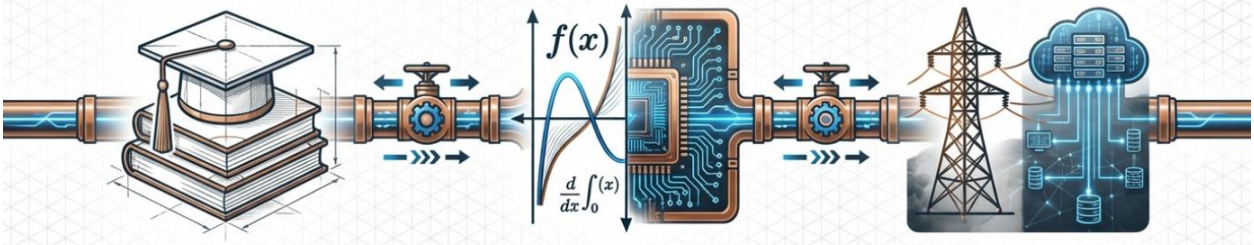
Bridging Theory, Technology, and Industry

A Strategic Framework for NATED/NCV Skills Development in the South African Energy Sector

Prepared for DHET, Industry Partners, and Academic Stakeholders

The Ecosystem Convergence Model

Executive Summary & Vision



Academic Rigor

Aligning NATED/NCV curriculum with SAQA & QCTO standards for standardized quality assurance.

Technical Precision

Fusing calculus-driven design (Derivatives/Integrals) with IoT & AI integration.

Industrial Alliance

Strategic partnerships with Eskom, Transnet, Microsoft, and City Power.

Key Insight: Moving the South African workforce from reactive maintenance to predictive optimization.

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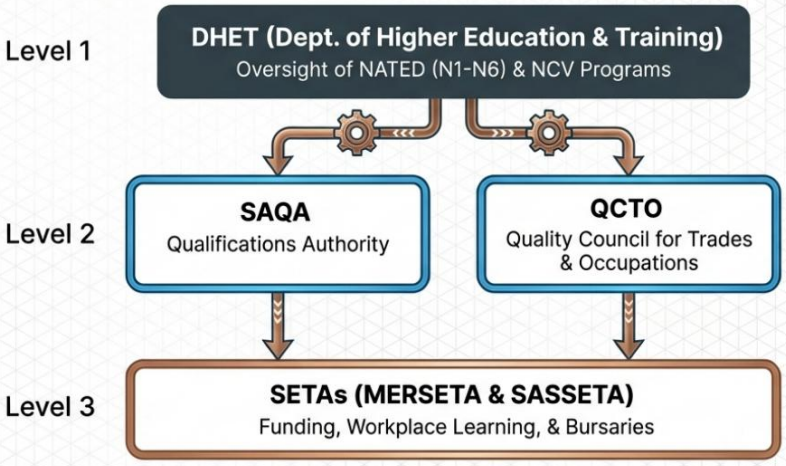
The Institutional Framework & Governance



Strategic Alignment

The DTIC (Dept. of Trade, Industry, and Competition) plays a critical role in aligning these educational outputs with labor market demands.

NotebookLM

The Mathematical Foundation of Engineering

Moving from technicians to analytical engineers.

Derivatives: Rate of Change

$$f'(x)$$

Analyzing real-time fluctuations in Current (I), Voltage (V), and Resistance (R) to predict system stability.

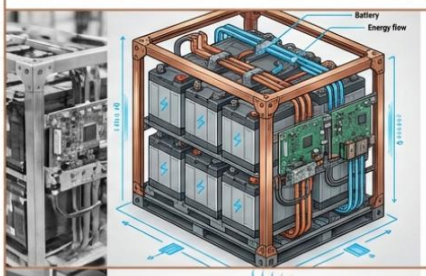
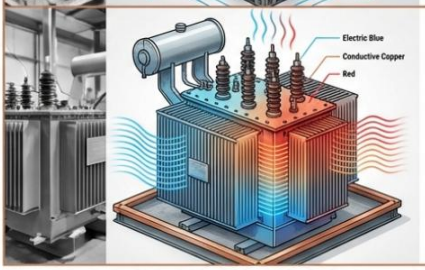
Integrals: Accumulation

$$\int$$

Calculating total Energy Storage and Load Capacity over time to determine efficiency.

NotebookLM

Applied Calculus: Integral Derivations in Power Systems

The Formula	The Application	
$W = \int V \, dQ$		Optimizing Battery Storage for Smart Grids (Energy based on charge distribution).
$Q = \int I^2 R \, dt$		Heat Dissipation Analysis: Preventing transformer fires and equipment overheating in data centers.

NotebookLM

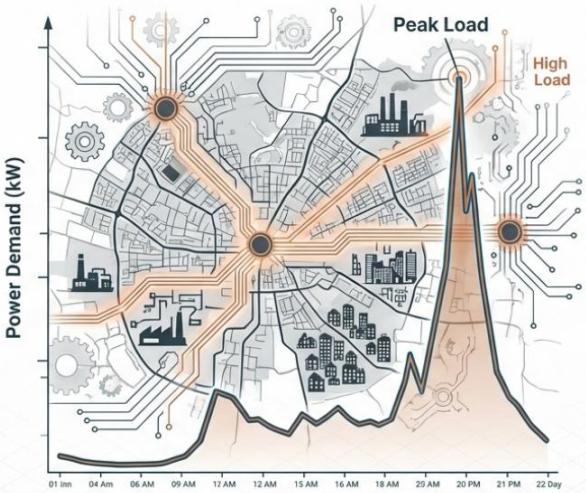
Electrical Infrastructure & Grid Stability

Stakeholders: City Power Johannesburg & Eskom

Load Balancing

$$Total\ Load = \int P(t)\,dt$$

Using integrals to distribute power efficiently during peak demand windows to mitigate load shedding.



Fault Detection

$$I_{fault} = V_{source}/Z_{system}$$

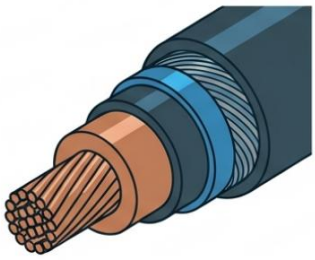
Configuring switchgear protection by calculating potential fault currents before they occur.

Experimental Application: Simulating load shedding restoration to minimize equipment damage.

NotebookLM

Material Science, Configuration & Safety

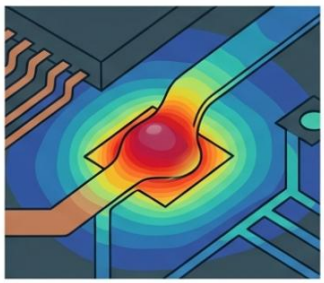
Resistivity Optimization



$$R = \frac{\rho L}{A}$$

Selecting Copper vs. Aluminum based on conductivity efficiency.

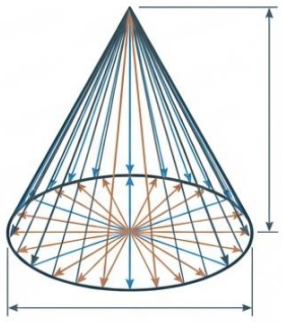
Thermal Management



$$Q = \int kA\Delta T\,dt$$

Modeling heat dissipation in electrical panels.

Cone Geometry



Calculating volume and stress for component structural integrity.

NotebookLM

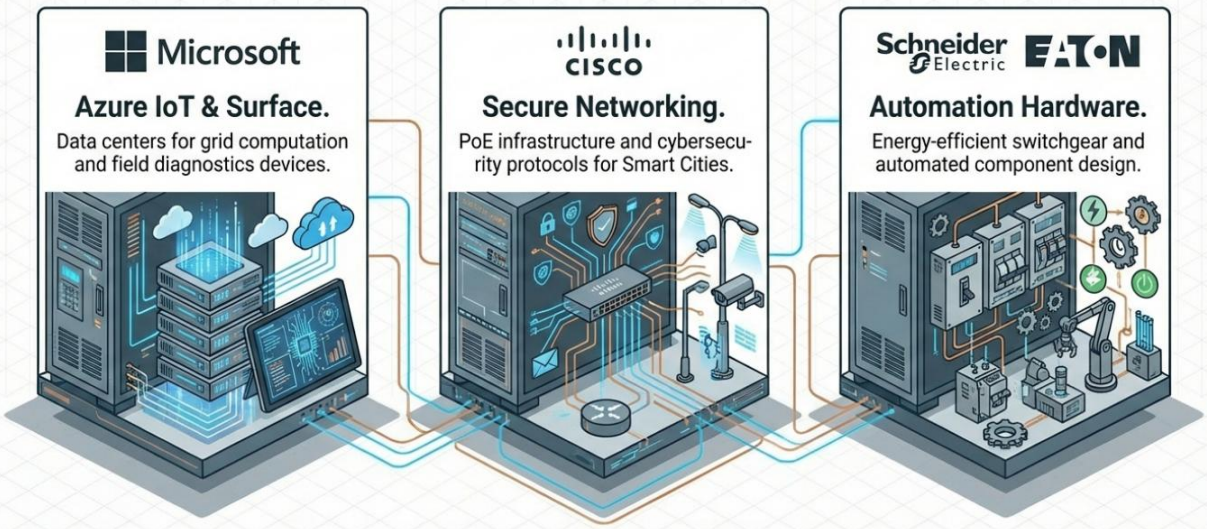
The Renewable Energy Transition

Preparing for a Green Energy Future (Solar, Wind, Hydro)

- **Solar:** Integrating Photovoltaic (PV) systems into the Eskom grid.
- **Hydro (SNEL):** Optimizing transmission from DRC to reduce grid loss.
- **Workforce Goal:** Upskilling for microgrid management and installation.

NotebookLM

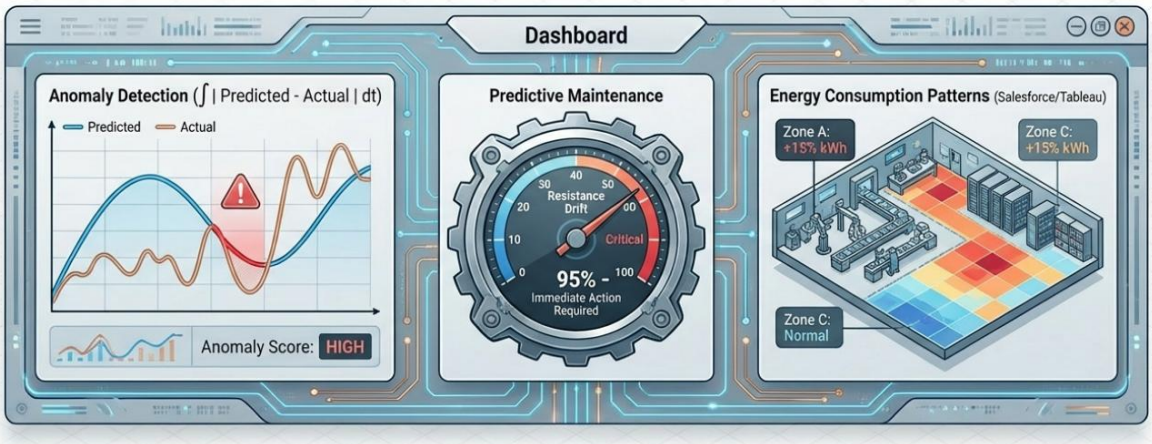
Industry 4.0: Hardware & Connectivity Partners



NotebookLM

Data-Driven Engineering: IoT & AI Integration

From Hardware to Managed Intelligence



Utilizing AI to detect faults in Industrial Control Systems (ICS) before failure occurs.

NotebookLM

Career Guidance & Assessment Ecosystem

Interest
Khetha: Career pathing tools aligning student interests with market demand.
Experience
Sci-Bono Discovery Centre: Hands-on STEM workshops and technical exhibits.
Assessment
Innovation: Using 'Exempters' and automated marking for data-driven student assessment.

NotebookLM

Specialized Career Tracks & Sectors

Logistics (Transnet)

Rail network optimization and port container storage efficiency.

Automotive (Ford / INPP)

EV battery longevity and aerodynamic drag reduction.

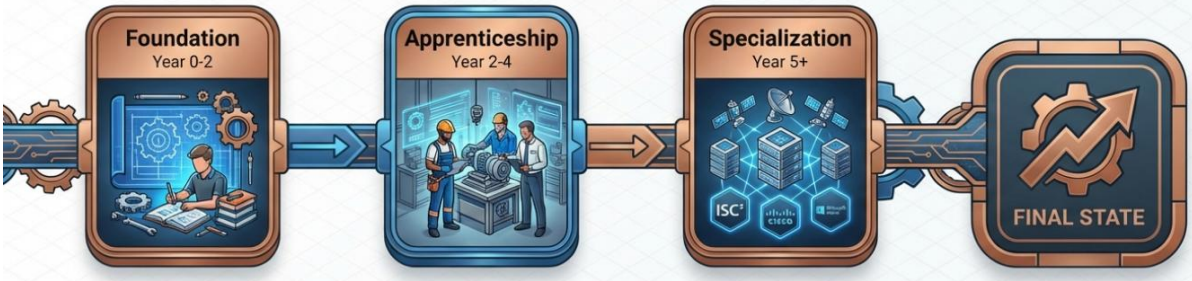
$$F_d = \frac{1}{2}\rho v^2 C_d A$$

FinTech (SARB / SARS)

Robotic automation for tax systems and banking machine maintenance.

NotebookLM

Professional Development & Certification Pathway



NATED N1-N6 Theory & NCV Practical Skills.

Workplace learning funded by SETAs (MERSETA/SASSETA).

Vendor Certifications (ISC², Cisco, Microsoft Azure).

Goal: Transition from Artisan to Specialist Engineer.

NotebookLM

Systemic Challenges & Digital Solutions

The Bottlenecks

- Material irregularities in transcripts.
- Backlogs in SITA-linked NN Diplomas.
- Disconnect between theory and workplace practice.

The Fixes

- **Digital Portals:** Automated tracking for certification backlogs.
- **Standardization:** Uniform ICASS assessment rubrics.
- **Consumer Protection:** Ensuring fair certification transit awards.

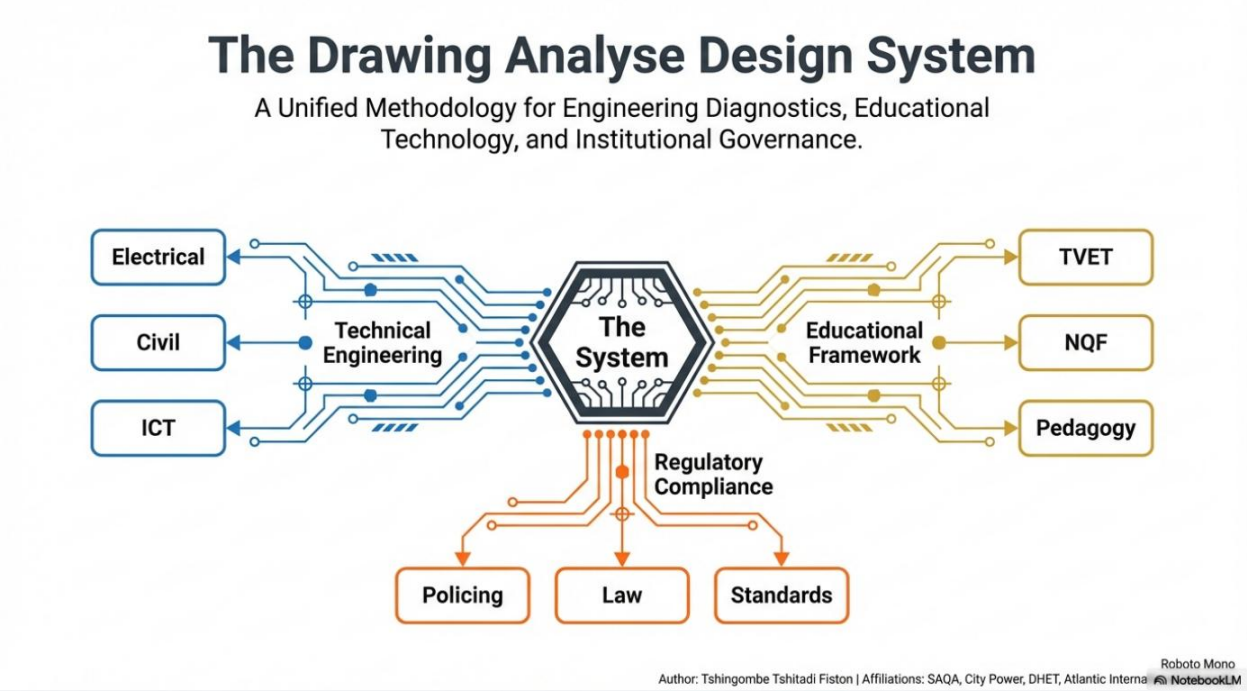
NotebookLM

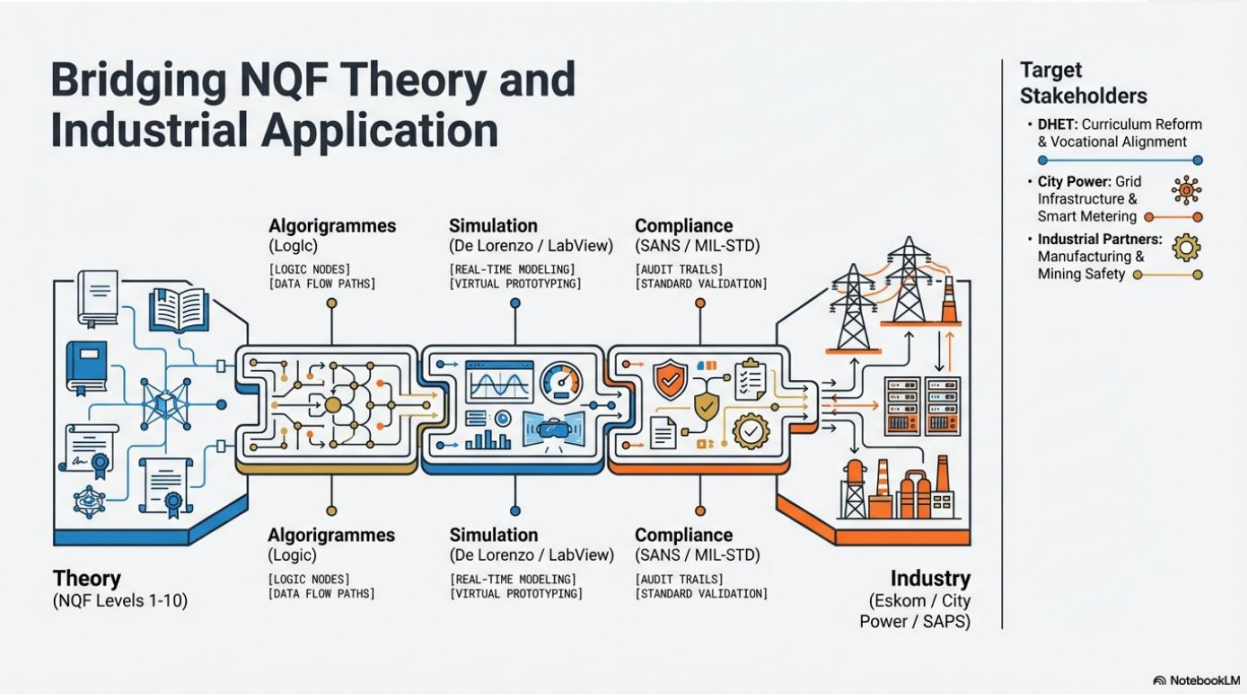
The Future Roadmap: A Call to Integrate

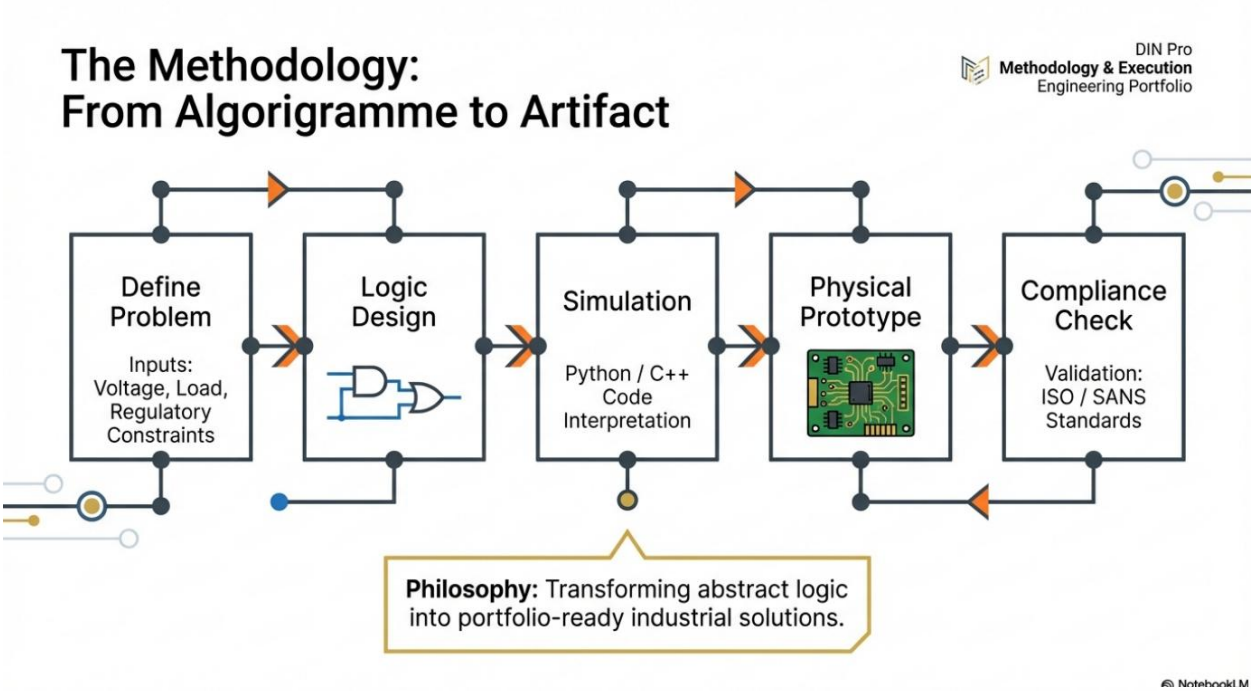
Workforce Competency
By fusing mathematical rigor with vocational training and industry partnership, we create a resilient, employable workforce powering South Africa's future.

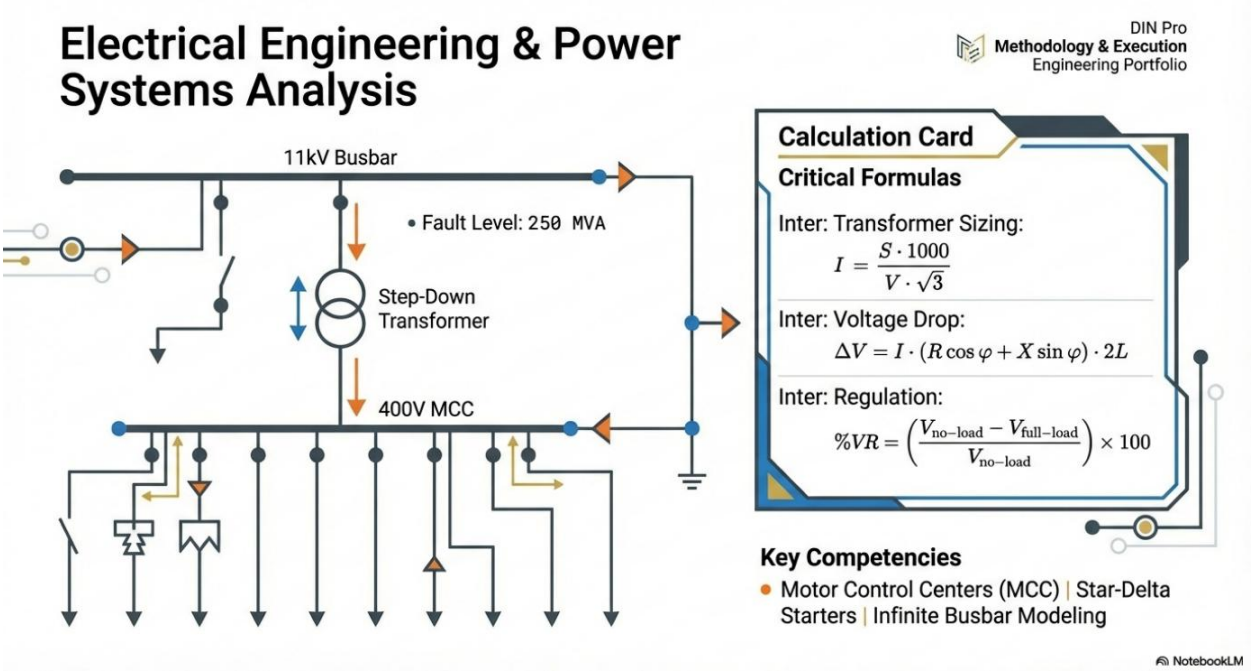
Vocational Skills + Calculus + Industry Tech = Sustainable Energy Future

NotebookLM


The Drawing Analyse Design System
A Unified Methodology for Engineering Diagnostics, Educational Technology, and Institutional Governance.
Electrical
Civil
ICT
Technical Engineering
The System
Educational Framework
TVET
NQF
Pedagogy
Regulatory Compliance
Policing
Law
Standards
Roboto Mono
Author: Tshingombe Tshitadi Fiston | Affiliations: SAQA, City Power, DHET, Atlantic Interna
NotebookLM


Bridging NQF Theory and Industrial Application
Algorigrammes (Logic)
[LOGIC NODES]
[DATA FLOW PATHS]
Simulation (De Lorenzo / LabView)
[REAL-TIME MODELING]
[VIRTUAL PROTOTYPING]
Compliance (SANS / MIL-STD)
[AUDIT TRAILS]
[STANDARD VALIDATION]
Theory (NQF Levels 1-10)
Industry (Eskom / City Power / SAPS)
Target Stakeholders
DHET: Curriculum Reform & Vocational Alignment
City Power: Grid Infrastructure & Smart Metering
Industrial Partners: Manufacturing & Mining Safety
NotebookLM


The Methodology:
From Algorigramme to Artifact
DIN Pro
Methodology & Execution
Engineering Portfolio
Define Problem
Inputs: Voltage, Load, Regulatory Constraints
Logic Design
Simulation
Python / C++ Code Interpretation
Physical Prototype
Compliance Check
Validation: ISO / SANS Standards
Philosophy: Transforming abstract logic into portfolio-ready industrial solutions.


Electrical Engineering & Power Systems Analysis
DIN Pro
Methodology & Execution
Engineering Portfolio
11kV Busbar
• Fault Level: 250 MVA
Step-Down Transformer
400V MCC
Calculation Card
Critical Formulas
Inter: Transformer Sizing:
$I = \frac{S \cdot 1000}{V \cdot \sqrt{3}}$
Inter: Voltage Drop:
$\Delta V = I \cdot (R \cos\varphi + X \sin\varphi) \cdot 2L$
Inter: Regulation:
$\%VR = \left(\frac{V_{no-load} - V_{full-load}}{V_{no-load}}\right) \times 100$
Key Competencies
• Motor Control Centers (MCC) | Star-Delta Starters | Infinite Busbar Modeling
NotebookLM

Renewable Energy Integration & Smart Grids

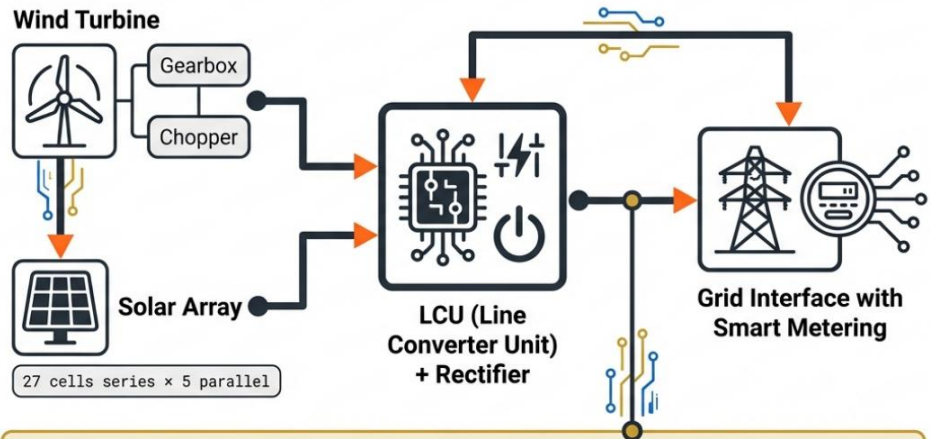
DIN Pro
Methodology & Execution
Engineering Portfolio

Load Sizing Categories

Light Load:
0–15 kW

Medium Load:
15–45 kW

Heavy Load:
45–150 kW



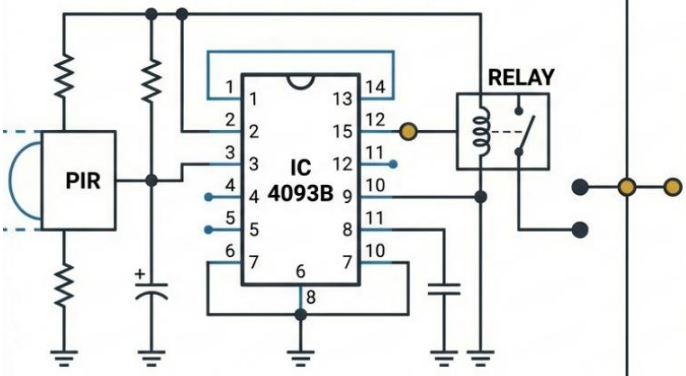
AI Integration: DL SGWD-AI modules for predictive load management and fault isolation via SCADA-WEB.

NotebookLM

Constructional Electronics: The Maker Portfolio

DIN Pro
Methodology & Execution
Engineering Portfolio

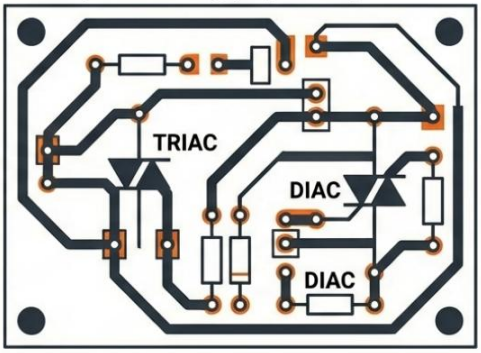
Project A: PIR-Triggered Mains Switch



Detection Range: 20m | Relay: 239V AC

Project B: Universal Motor Speed Controller

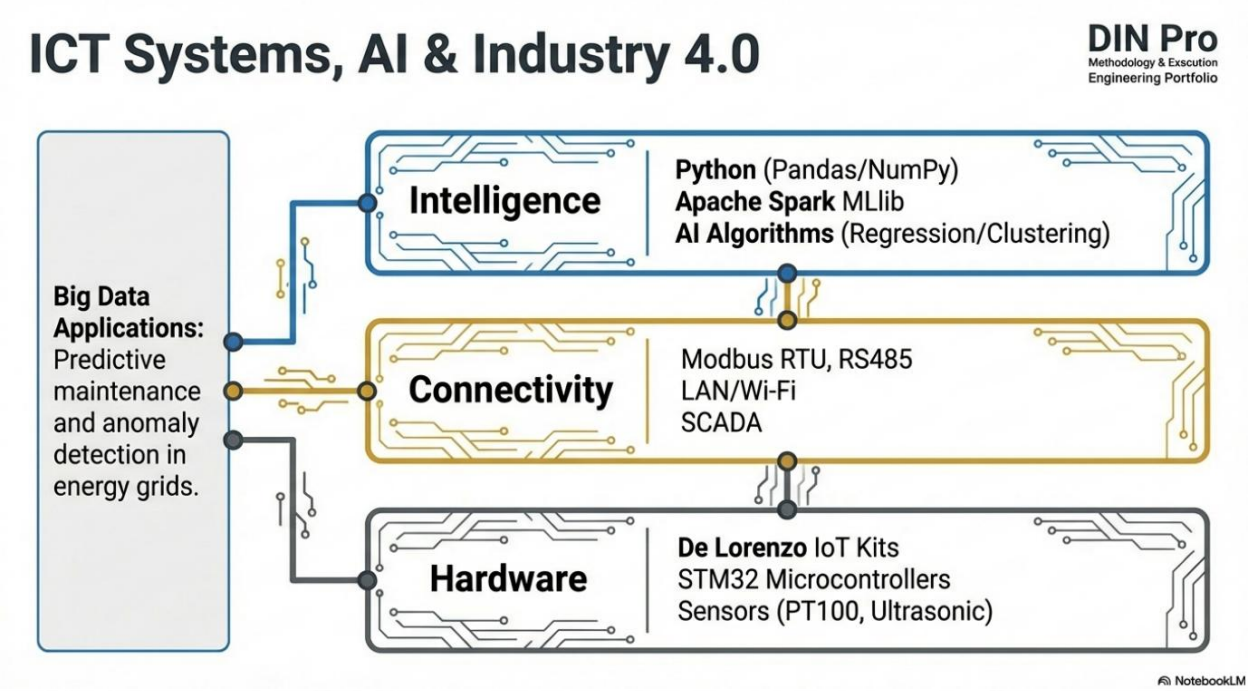
PCB Layout Drawing (top view)

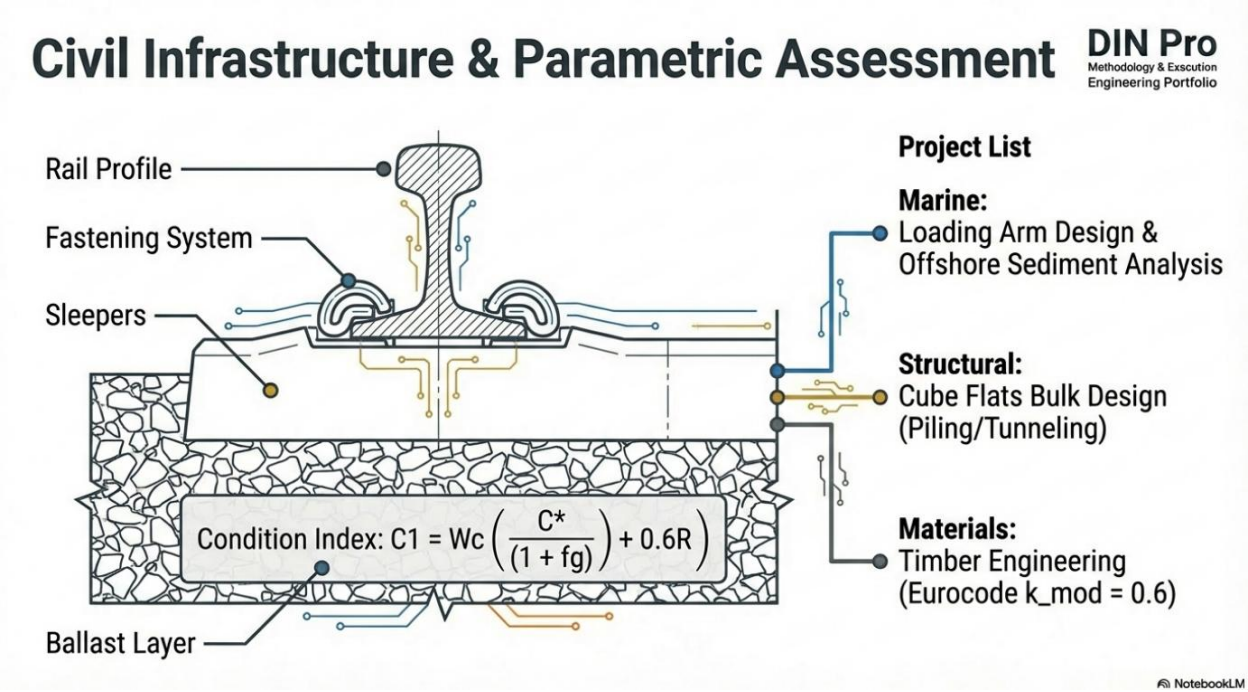


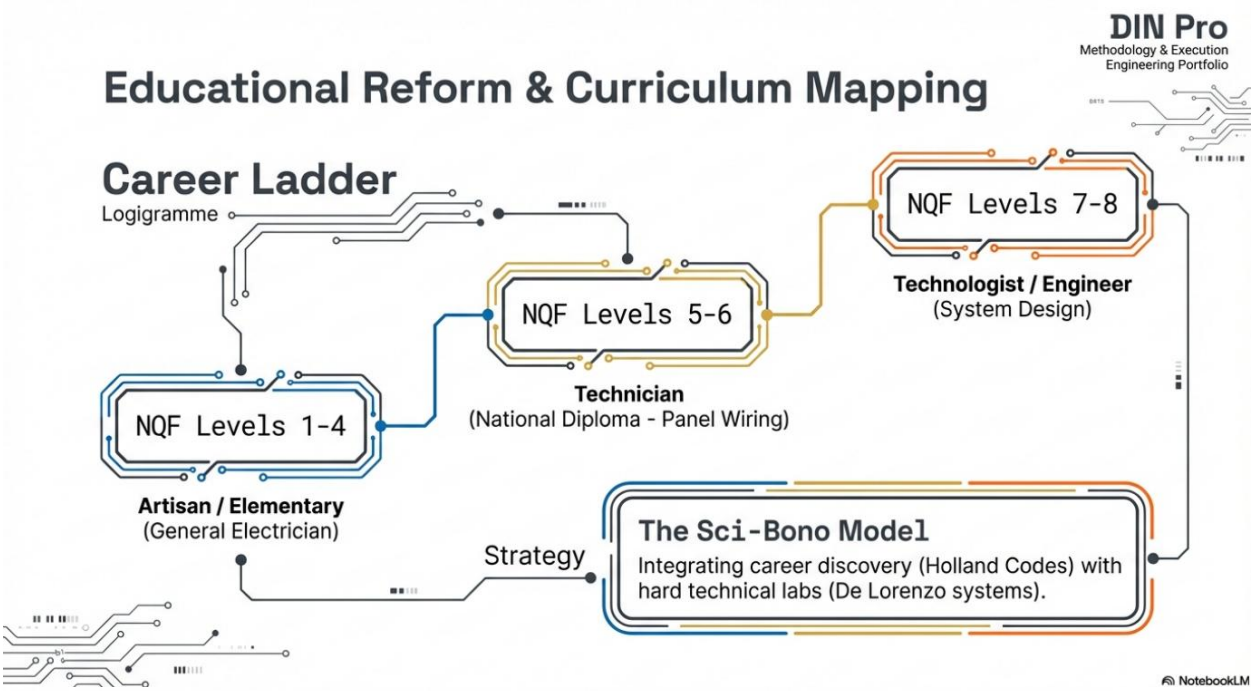
Application: Drill/Fan Speed Control

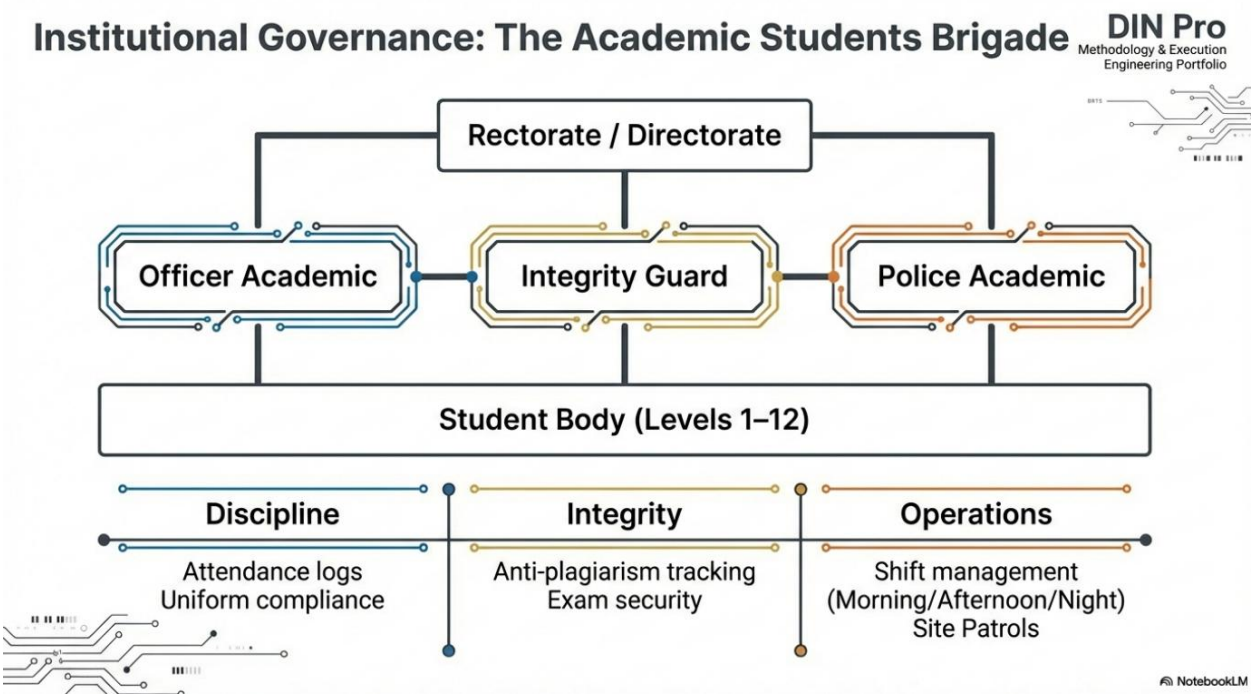
"Bridging analog construction with digital control logic." in Inter

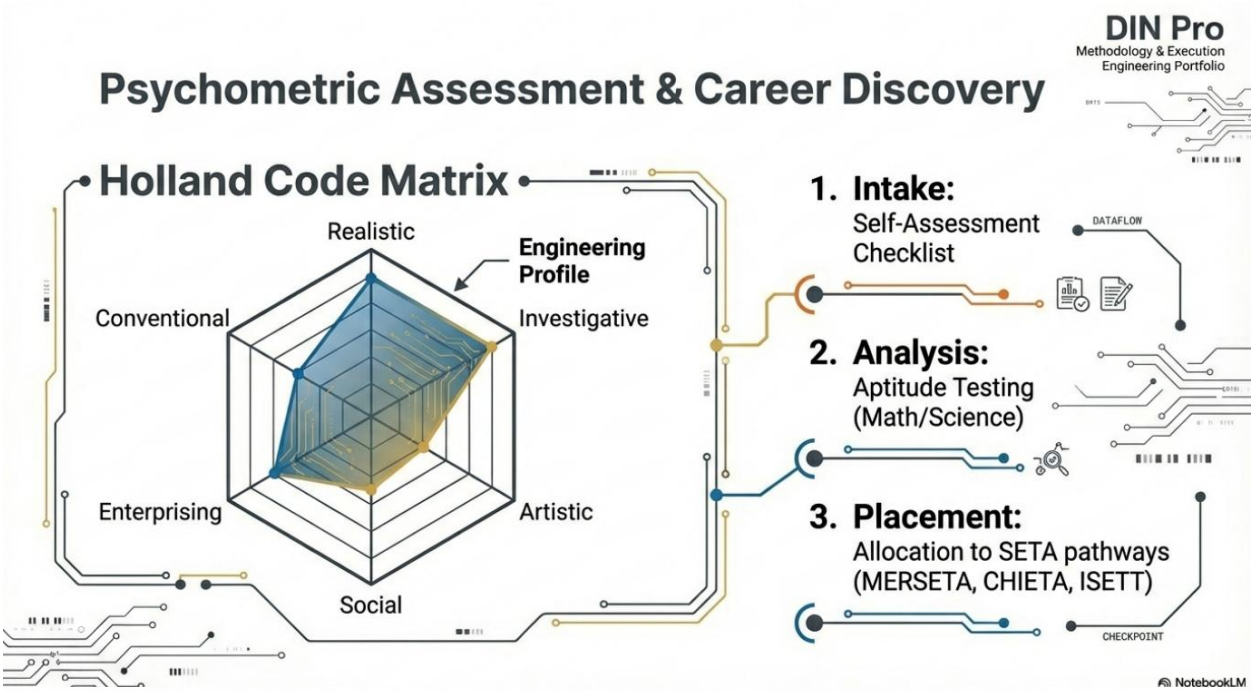
NotebookLM

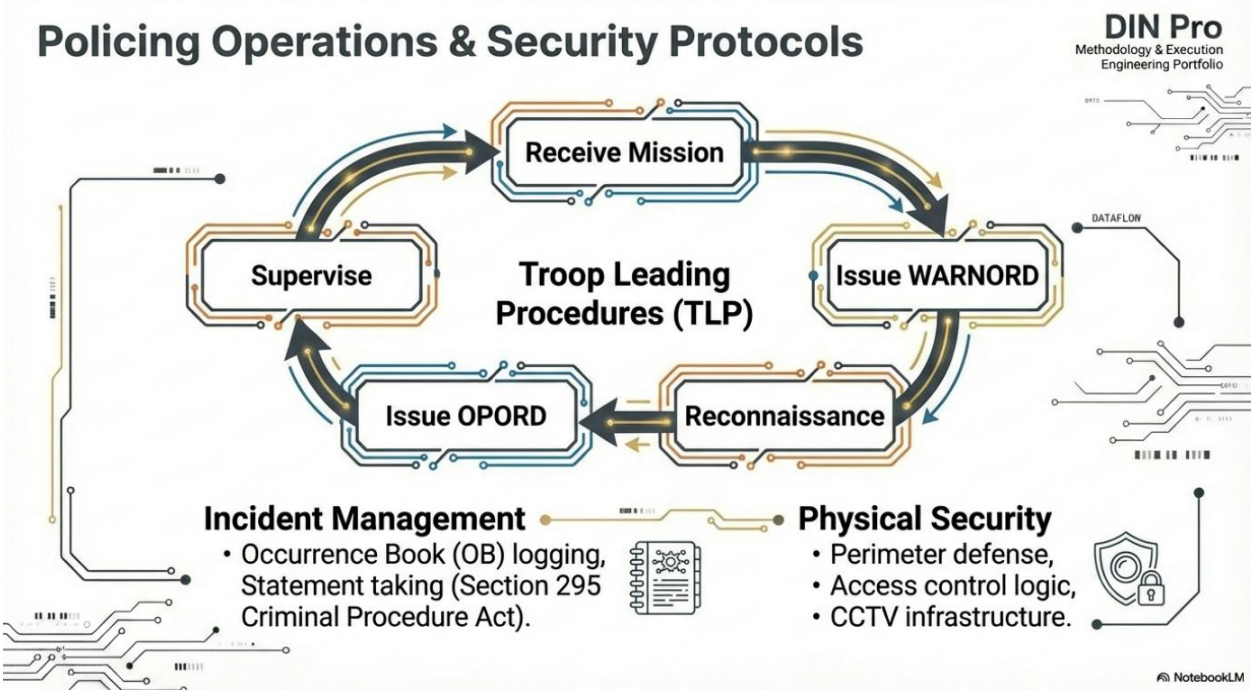

ICT Systems, AI & Industry 4.0
DIN Pro
Methodology & Exscution
Engineering Portfolio
Big Data Applications: Predictive maintenance and anomaly detection in energy grids.
Intelligence
Python (Pandas/NumPy)
Apache Spark MLlib
AI Algorithms (Regression/Clustering)
Connectivity
Modbus RTU, RS485
LAN/Wi-Fi
SCADA
Hardware
De Lorenzo IoT Kits
STM32 Microcontrollers
Sensors (PT100, Ultrasonic)
NotebookLM

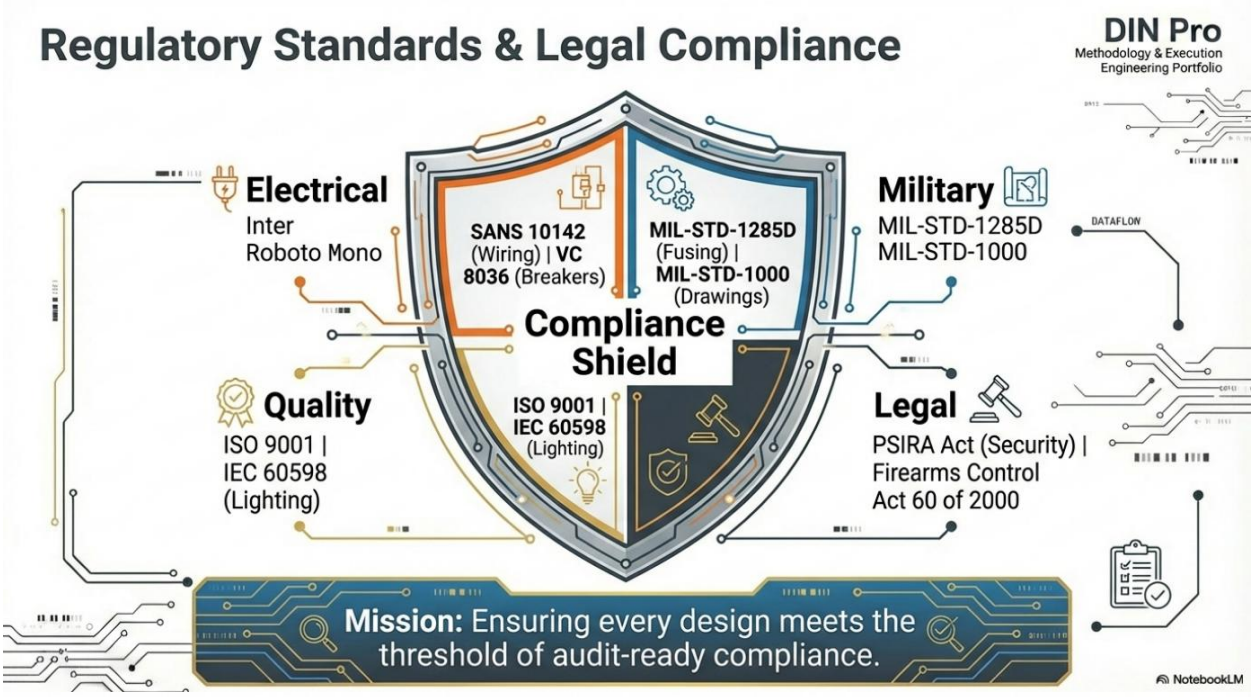

Civil Infrastructure & Parametric Assessment
DIN Pro
Methodology & Exscution
Engineering Portfolio
Rail Profile
Fastening System
Sleepers
Ballast Layer
Condition Index: C1 = Wc (C* / (1 + fg)) + 0.6R
Project List
Marine:
Loading Arm Design & Offshore Sediment Analysis
Structural:
Cube Flats Bulk Design (Piling/Tunneling)
Materials:
Timber Engineering (Eurocode k_mod = 0.6)
NotebookLM

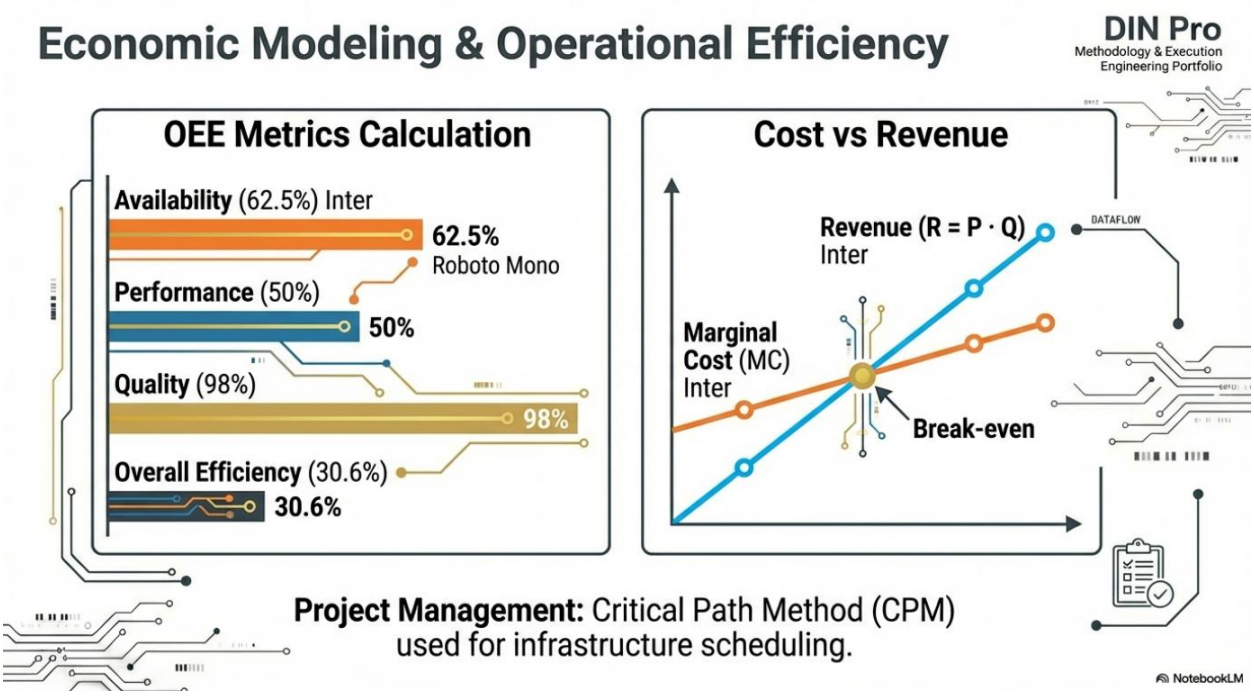

DIN Pro
Methodology & Execution
Engineering Portfolio
Educational Reform & Curriculum Mapping
Career Ladder
Logigramme
NQF Levels 7-8
Technologist / Engineer
(System Design)
NQF Levels 5-6
Technician
(National Diploma - Panel Wiring)
NQF Levels 1-4
Artisan / Elementary
(General Electrician)
Strategy
The Sci-Bono Model
Integrating career discovery (Holland Codes) with hard technical labs (De Lorenzo systems).
NotebookLM

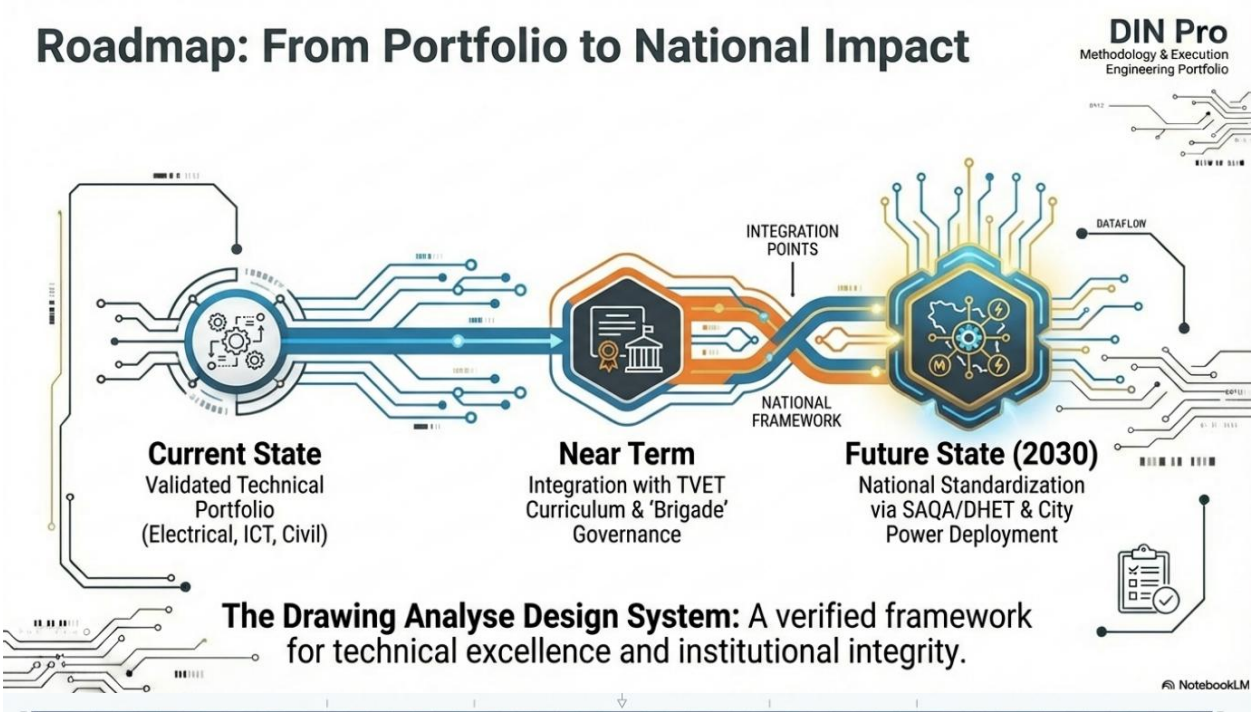

Institutional Governance: The Academic Students Brigade
DIN Pro
Methodology & Execution
Engineering Portfolio
Rectorate / Directorate
Officer Academic
Integrity Guard
Police Academic
Student Body (Levels 1–12)
Discipline
Attendance logs
Uniform compliance
Integrity
Anti-plagiarism tracking
Exam security
Operations
Shift management
(Morning/Afternoon/Night)
Site Patrols
NotebookLM

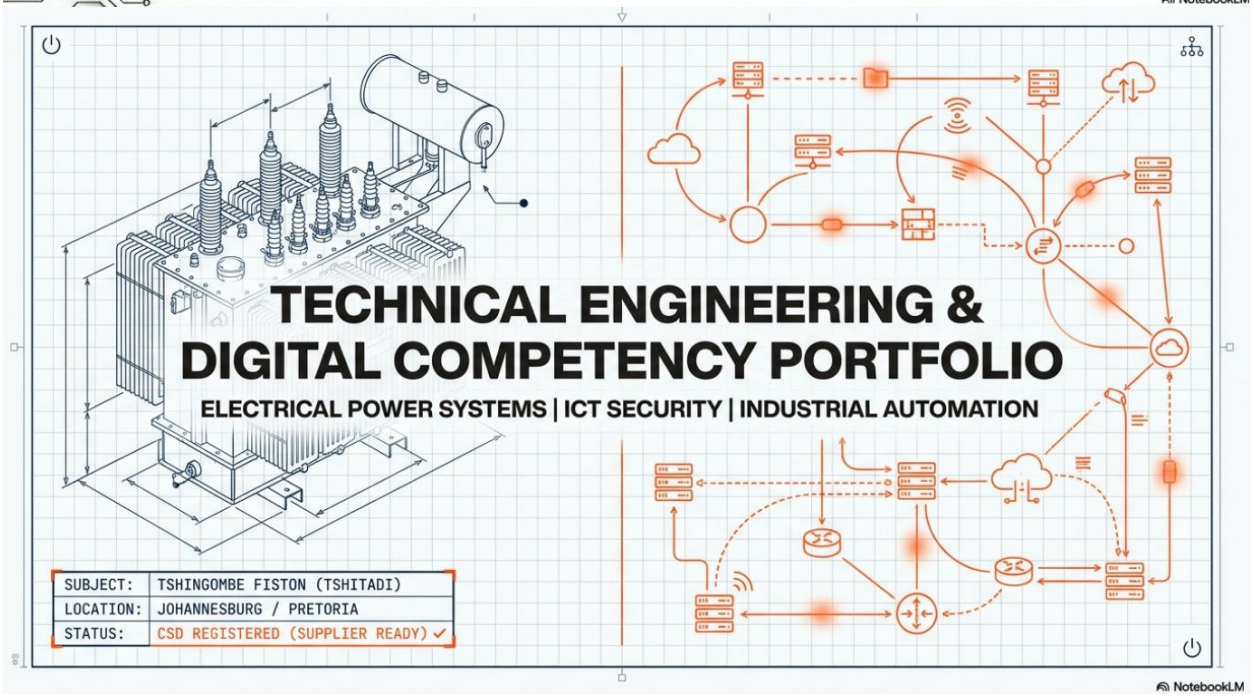

DIN Pro
Methodology & Execution
Engineering Portfolio
Psychometric Assessment & Career Discovery
Holland Code Matrix
Realistic
Engineering Profile
Investigative
Conventional
Enterprising
Artistic
Social
1. Intake:
Self-Assessment Checklist
DATAFLOW
2. Analysis:
Aptitude Testing (Math/Science)
3. Placement:
Allocation to SETA pathways (MERSETA, CHIETA, ISETT)
CHECKPOINT
NotebookLM

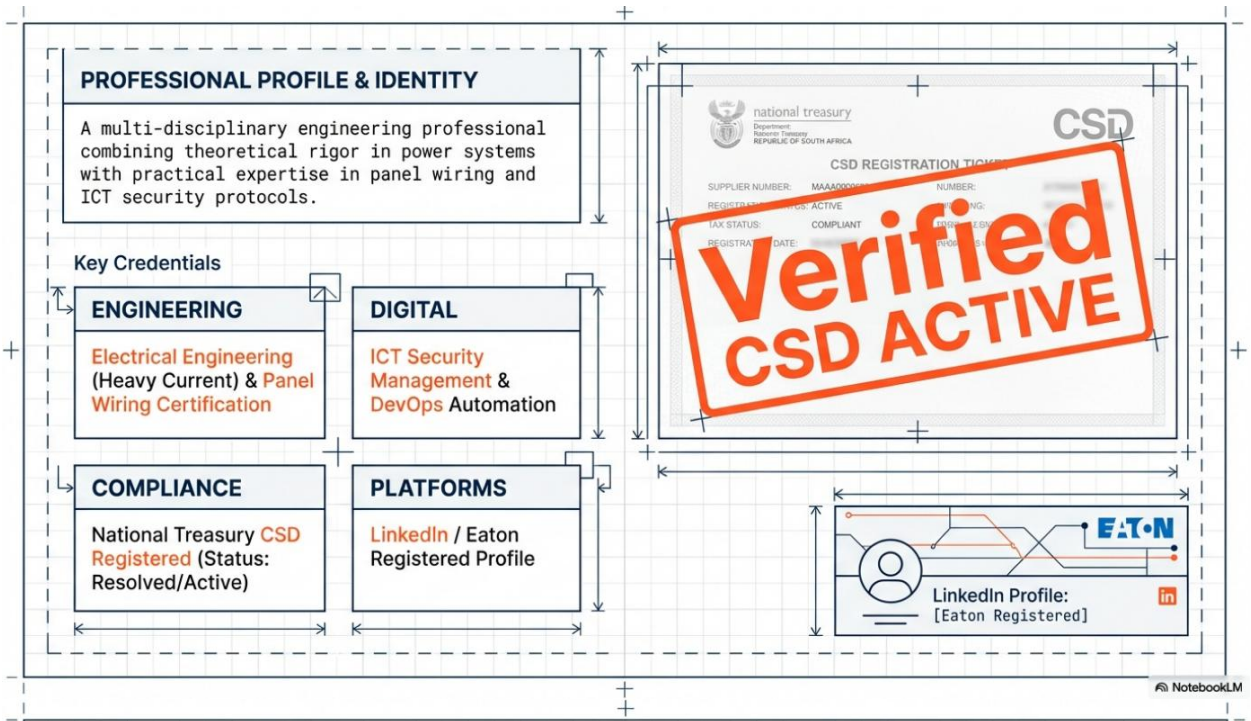

Policing Operations & Security Protocols
DIN Pro
Methodology & Execution
Engineering Portfolio
Receive Mission
Issue WARNORD
Reconnaissance
Issue OPORD
Supervise
Troop Leading Procedures (TLP)
DATAFLOW
Incident Management
• Occurrence Book (OB) logging, Statement taking (Section 295 Criminal Procedure Act).
Physical Security
• Perimeter defense,
• Access control logic,
• CCTV infrastructure.
NotebookLM

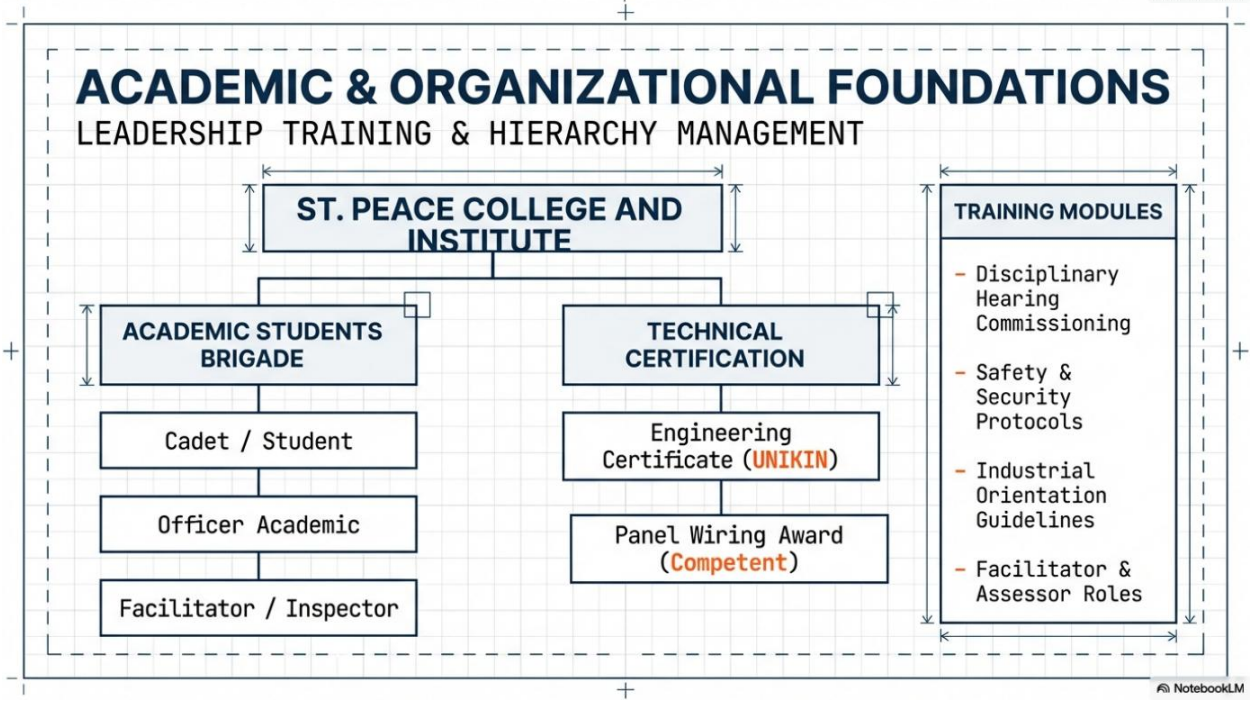

Regulatory Standards & Legal Compliance
DIN Pro
Methodology & Execution
Engineering Portfolio
Electrical
Inter
Roboto Mono
SANS 10142
(Wiring) | VC
8036 (Breakers)
MIL-STD-1285D
(Fusing) |
MIL-STD-1000
(Drawings)
Compliance
Shield
ISO 9001 |
IEC 60598
(Lighting)
Military
MIL-STD-1285D
MIL-STD-1000
Quality
ISO 9001 |
IEC 60598
(Lighting)
Legal
PSIRA Act (Security) |
Firearms Control
Act 60 of 2000
DATAFLOW
Mission: Ensuring every design meets the
threshold of audit-ready compliance.
NotebookLM


Economic Modeling & Operational Efficiency
DIN Pro
Methodology & Execution
Engineering Portfolio
OEE Metrics Calculation
Availability (62.5%) Inter
62.5%
Roboto Mono
Performance (50%)
50%
Quality (98%)
98%
Overall Efficiency (30.6%)
30.6%
Cost vs Revenue
Revenue (R = P · Q)
Inter
Marginal
Cost (MC)
Inter
Break-even
DATAFLOW
Project Management: Critical Path Method (CPM)
used for infrastructure scheduling.
NotebookLM


Roadmap: From Portfolio to National Impact
DIN Pro
Methodology & Execution Engineering Portfolio
INTEGRATION POINTS
DATAFLOW
NATIONAL FRAMEWORK
Current State
Validated Technical Portfolio (Electrical, ICT, Civil)
Near Term
Integration with TVET Curriculum & 'Brigade' Governance
Future State (2030)
National Standardization via SAQA/DHET & City Power Deployment
The Drawing Analyse Design System: A verified framework for technical excellence and institutional integrity.
NotebookLM


TECHNICAL ENGINEERING & DIGITAL COMPETENCY PORTFOLIO
ELECTRICAL POWER SYSTEMS | ICT SECURITY | INDUSTRIAL AUTOMATION
SUBJECT: TSHINGOMBE FISTON (TSHITADI)
LOCATION: JOHANNESBURG / PRETORIA
STATUS: CSD REGISTERED (SUPPLIER READY) ✓
NotebookLM


PROFESSIONAL PROFILE & IDENTITY
A multi-disciplinary engineering professional combining theoretical rigor in power systems with practical expertise in panel wiring and ICT security protocols.
Key Credentials
ENGINEERING
Electrical Engineering (Heavy Current) & Panel Wiring Certification
DIGITAL
ICT Security Management & DevOps Automation
COMPLIANCE
National Treasury CSD Registered (Status: Resolved/Active)
PLATFORMS
LinkedIn / Eaton Registered Profile
national treasury
CSD
CSD REGISTRATION TICKET
SUPPLIER NUMBER:
NUMBER:
TAX STATUS:
COMPLIANT
Verified
CSD ACTIVE
EATON
LinkedIn Profile:
[Eaton Registered]
NotebookLM

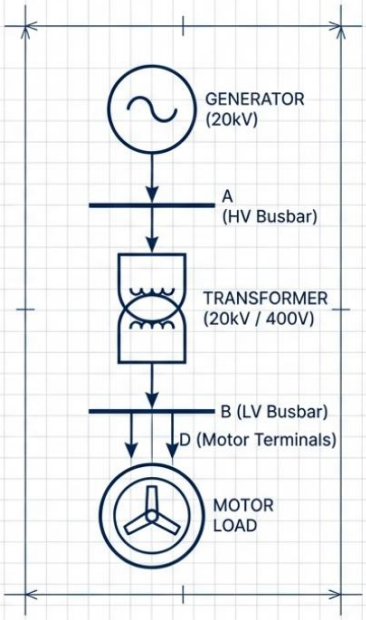

ACADEMIC & ORGANIZATIONAL FOUNDATIONS
LEADERSHIP TRAINING & HIERARCHY MANAGEMENT
ST. PEACE COLLEGE AND INSTITUTE
ACADEMIC STUDENTS BRIGADE
Cadet / Student
Officer Academic
Facilitator / Inspector
TECHNICAL CERTIFICATION
Engineering Certificate (UNIKIN)
Panel Wiring Award (Competent)
TRAINING MODULES
- Disciplinary Hearing Commissioning
- Safety & Security Protocols
- Industrial Orientation Guidelines
- Facilitator & Assessor Roles
NotebookLM

POWER SYSTEMS ANALYSIS

NETWORK FAULTS & IMPEDANCE MATHEMATICS

Data Callout Box

```
// FAULT ANALYSIS PROOF
Imp_Upstream = (20 * 10^3)^2 / (500 * 10^6)

Z_Matrix_Stability = TRUE
Fault_Locations = {Point A: HV Busbar,
                   Point B: LV Busbar,
                   Point D: Motor Terminals}
I_peak calculation for Asymmetrical Faults
verified.
```

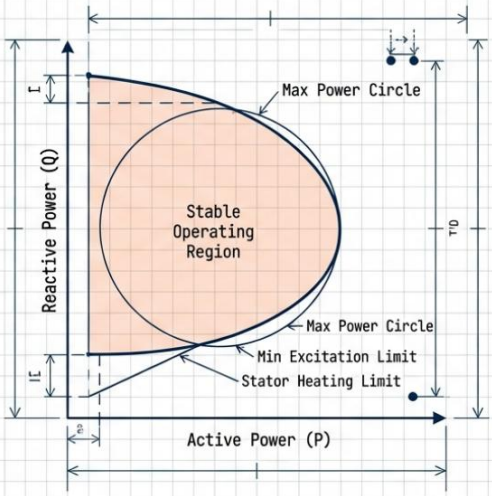


NotebookLM

ELECTRICAL MACHINES

TRANSFORMERS & GENERATORS SPECIFICATIONS

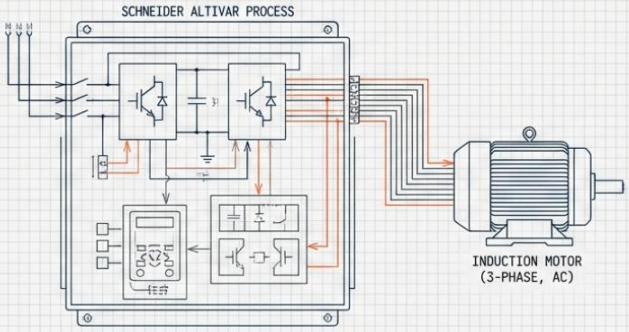
```
// GENERATOR PARAMS
- Sync Machine Analysis: X"d = 17%,
  Xd(sat) = 200%
- Potier Reactance: Xp calculation verified
- Excitation Voltage: Ep = 1.175 p.u.

// TRANSFORMER SIZING
- Efficiency Analysis: Iron Loss (40W) /
  Copper Loss (160W)
- Rating: 10kVA Units
- Winding Ratio: Primary/Secondary Analysis
```



NotebookLM

MOTOR CONTROL SYSTEMS & DRIVES

VFD CONFIGURATION & DYNAMIC BRAKING



TORQUE PHYSICS

- T = K * I_a
- Moment of Inertia (J) Integration

BRAKING ANALYSIS

- Dynamic Braking Time: Integral J(dw/dt)
- Deceleration: 183 rad/s -> 0

TESTING PROTOCOLS

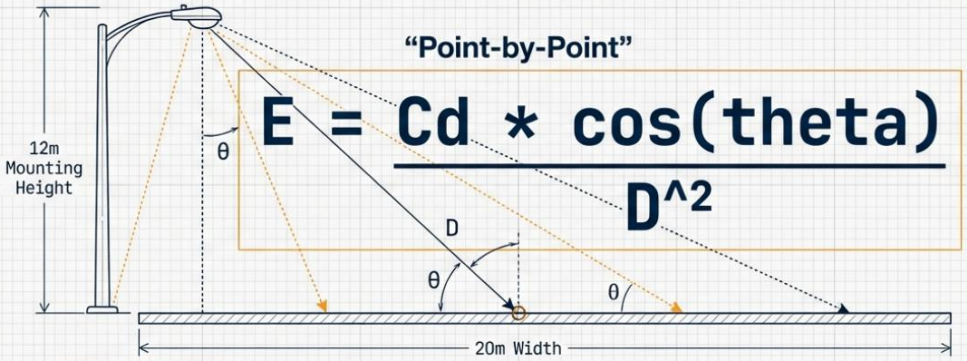
- ✓ Locked Rotor Test: Passed
- ✓ No-Load Test: Analysis Complete

EATON
Powering Business Worldwide

NotebookLM

ILLUMINATION DESIGN & PHOTOMETRICS

INDUSTRIAL & ROADWAY LIGHTING PHYSICS



"Point-by-Point"

$$E = \frac{Cd * \cos(\theta)}{D^2}$$

METHODOLOGIES:

- **Lumen Method:** Zone Cavity Ratios & Coefficient of Utilization (CU)
- **Iso-Candela Analysis:** Photometric curve interpretation
- **Applications:** High Bay Industrial (Metal Halide vs. HPS) & Staggered Roadway Spacing

EATON
Powering Business Worldwide

NotebookLM

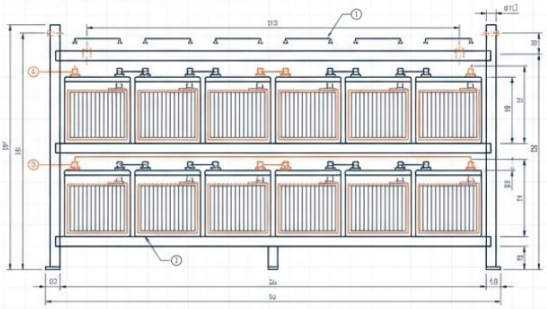
ENERGY ECONOMICS & PLANT MANAGEMENT

COST ANALYSIS, COGENERATION & STORAGE

FINANCIAL MODELING

- **Tariff Analysis:** Load Factor (Daily vs. Annual)
- **Plant Efficiency:** Cogeneration Heat Rate (10,550 kJ/kWh)
- **Cost Penalty Analysis:** Generation Units A, B, C based on Fuel Price ($/MBtu)

STORAGE SIZING



Application: Stationary Backup
Chemistry: Lead-Acid Sizing
Specific Gravity Calculation: 1215

EATON

NotebookLM

DEVOPS AUTOMATION & CLOUD ENGINEERING

CI/CD PIPELINES | AUTOMATED TESTING | GIT

Microsoft Azure DevOps

Git

```
ChromeOptions browserOptions = new ChromeOptions();

ltOptions.put("visual", true);
ltOptions.put("timezone", "Johannesburg");
ltOptions.put("build", "tshingombe_engineering");

// LambdaTest Integration Active
```

Dark Terminal

Selenium

LambdaTest

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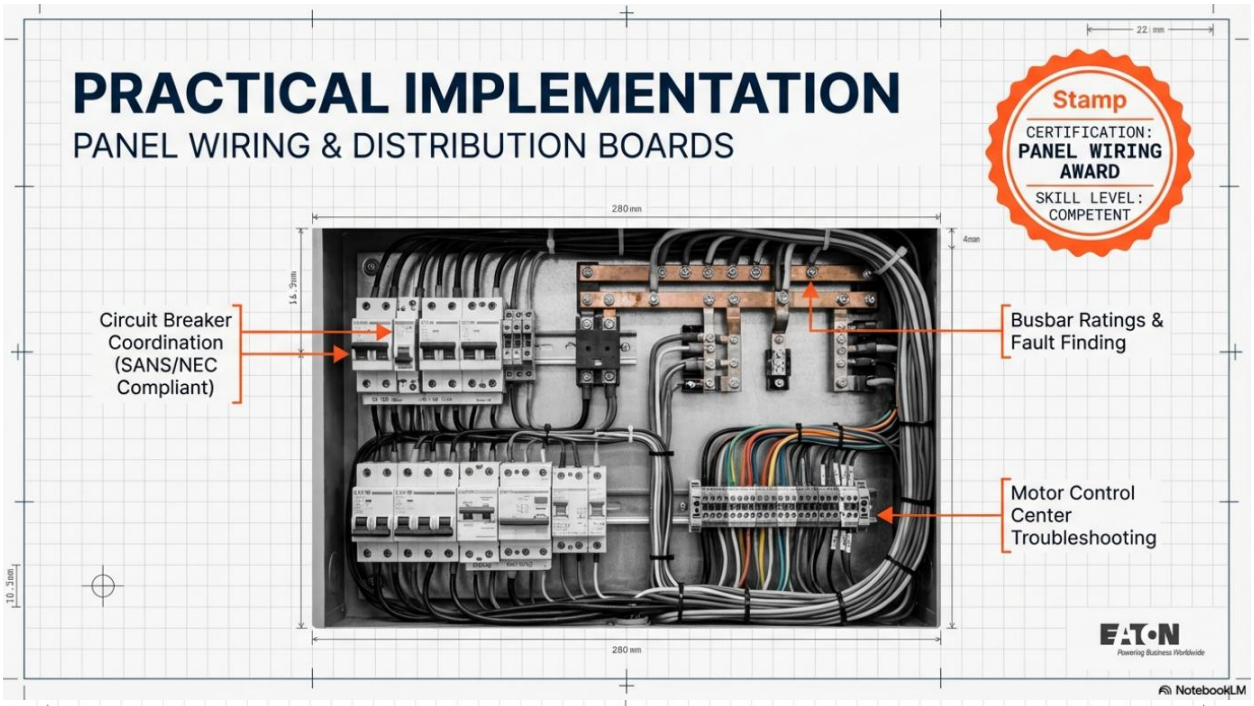
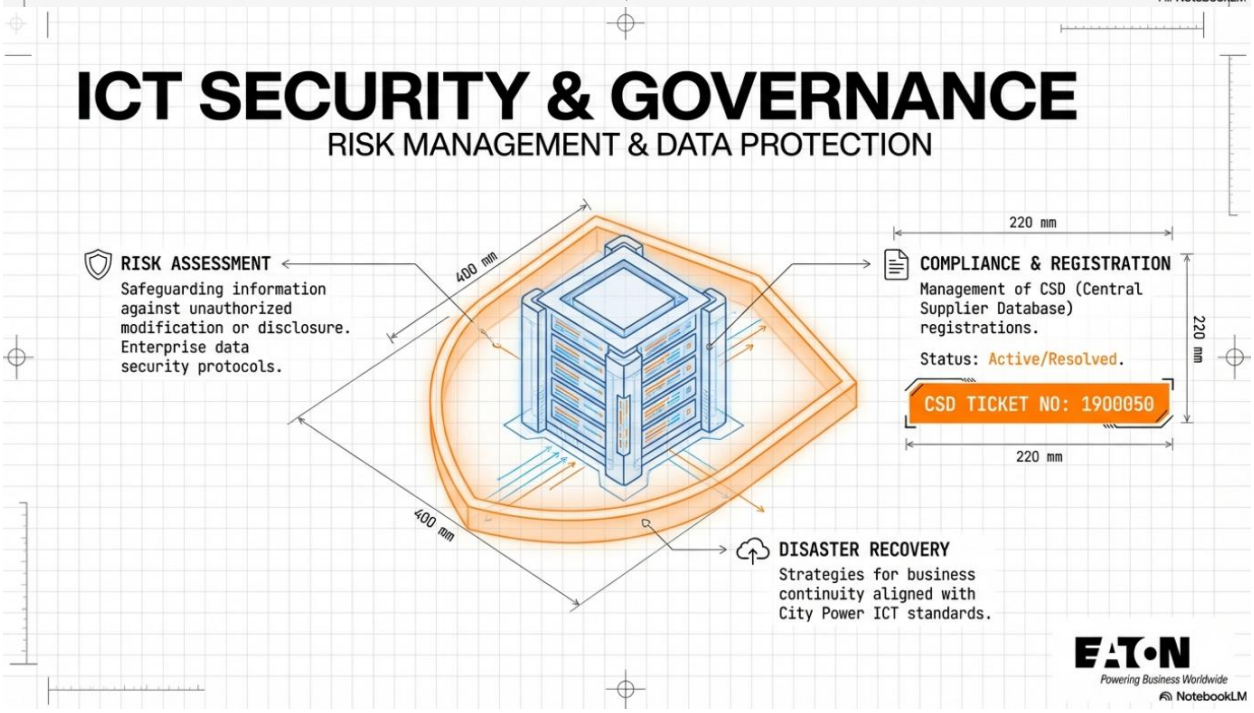
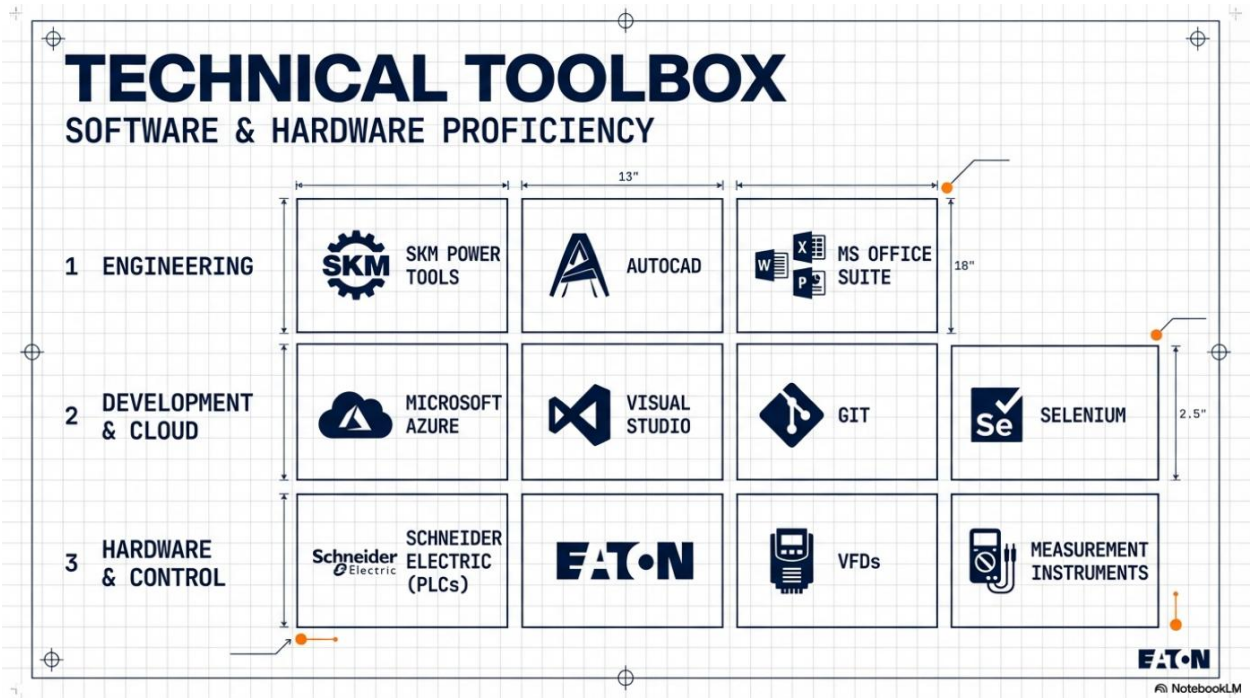
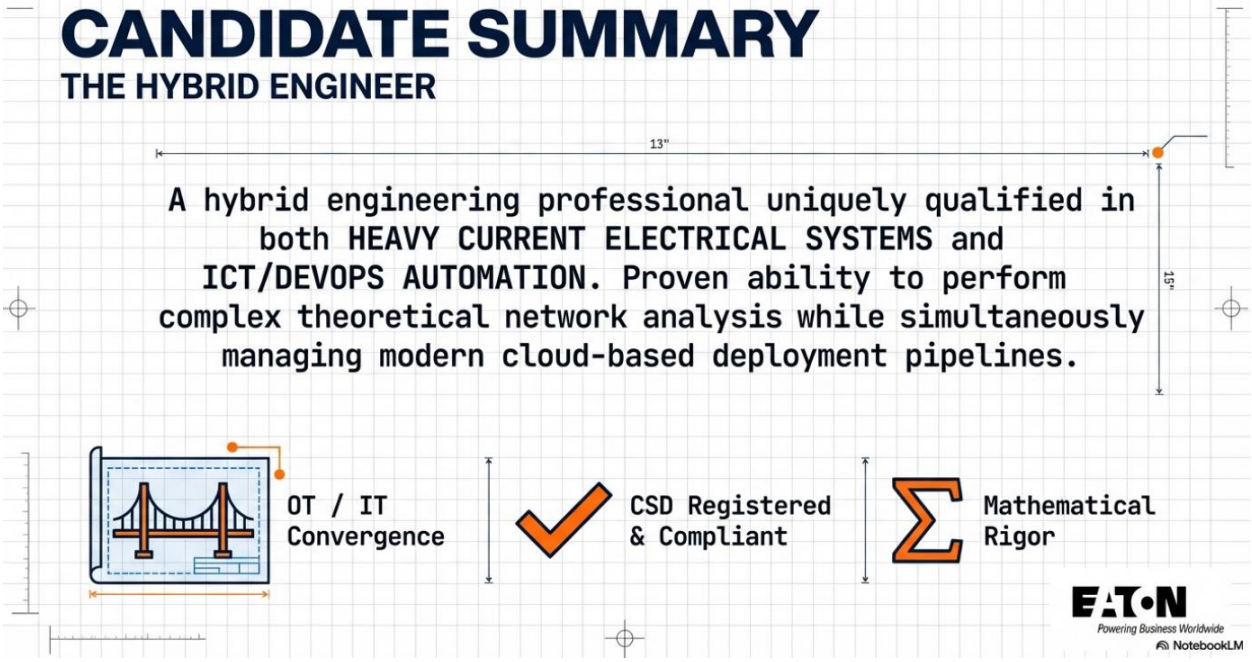
Powering Business Worldwide

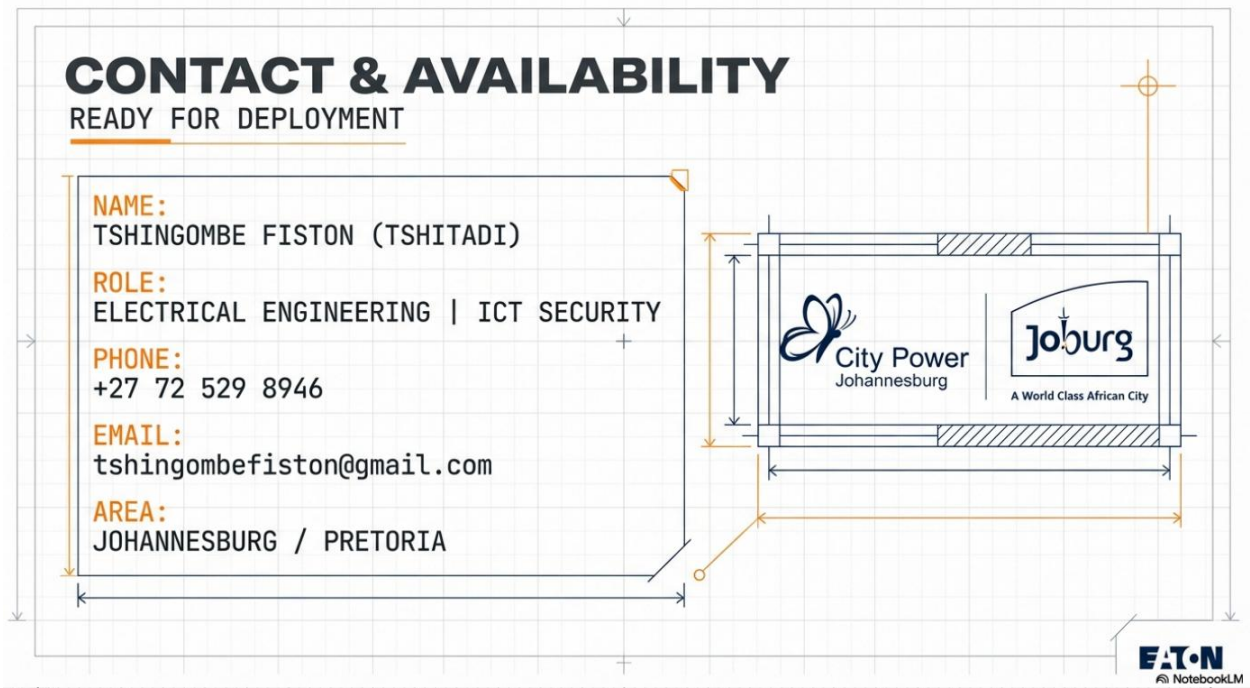
NotebookLM

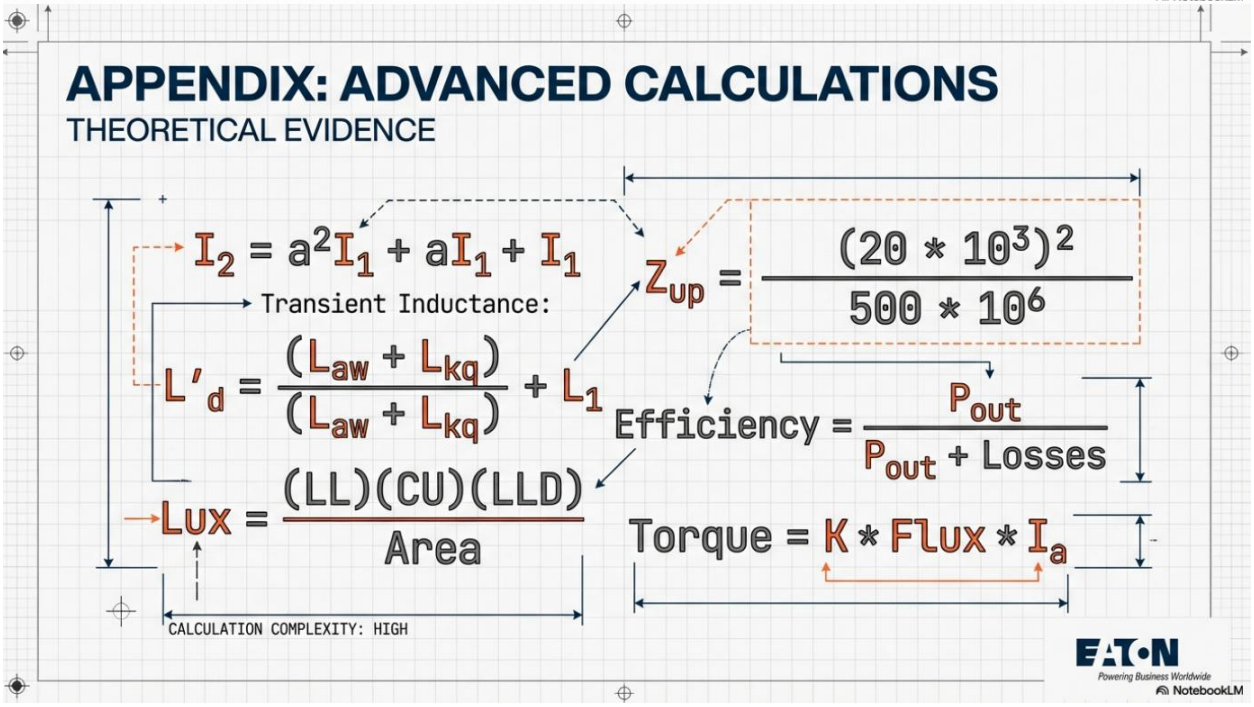

PRACTICAL IMPLEMENTATION
PANEL WIRING & DISTRIBUTION BOARDS
Stamp
CERTIFICATION:
PANEL WIRING AWARD
SKILL LEVEL:
COMPETENT
Circuit Breaker Coordination (SANS/NEC Compliant)
Busbar Ratings & Fault Finding
Motor Control Center Troubleshooting
280 mm
280 mm
EATON
Powering Business Worldwide
NotebookLM

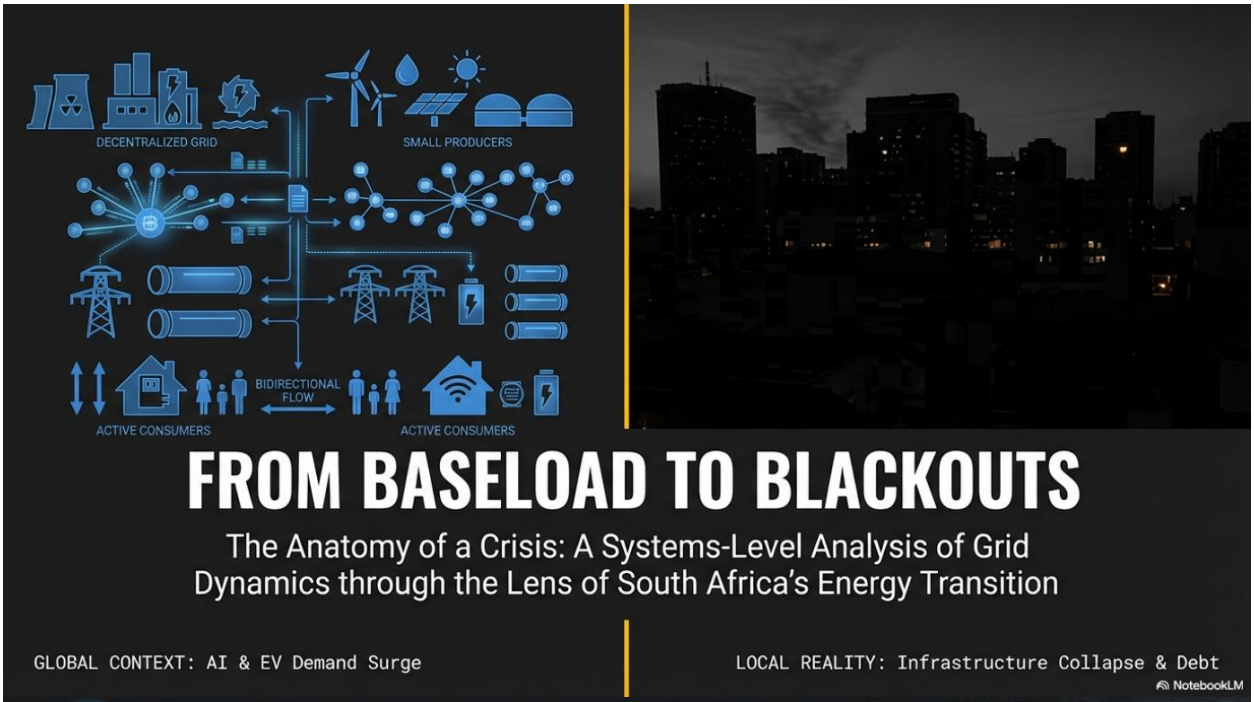

ICT SECURITY & GOVERNANCE
RISK MANAGEMENT & DATA PROTECTION
RISK ASSESSMENT
Safeguarding information against unauthorized modification or disclosure. Enterprise data security protocols.
400 mm
400 mm
220 mm
220 mm
COMPLIANCE & REGISTRATION
Management of CSD (Central Supplier Database) registrations.
Status: Active/Resolved.
CSD TICKET NO: 1900050
DISASTER RECOVERY
Strategies for business continuity aligned with City Power ICT standards.
EATON
Powering Business Worldwide
NotebookLM

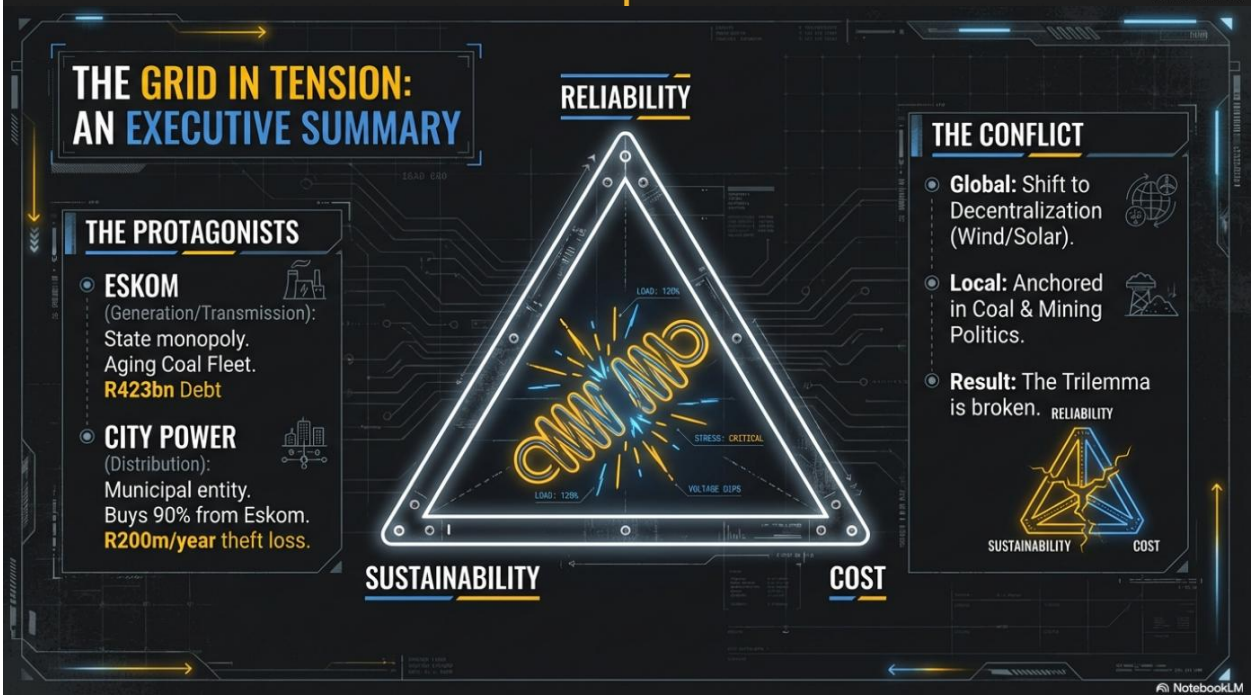

TECHNICAL TOOLBOX
SOFTWARE & HARDWARE PROFICIENCY
13"
1 ENGINEERING
SKM POWER TOOLS
AUTOCAD
MS OFFICE SUITE
18"
2 DEVELOPMENT & CLOUD
MICROSOFT AZURE
VISUAL STUDIO
GIT
SELENIUM
2.5"
3 HARDWARE & CONTROL
SCHNEIDER ELECTRIC (PLCs)
VFDs
MEASUREMENT INSTRUMENTS
NotebookLM

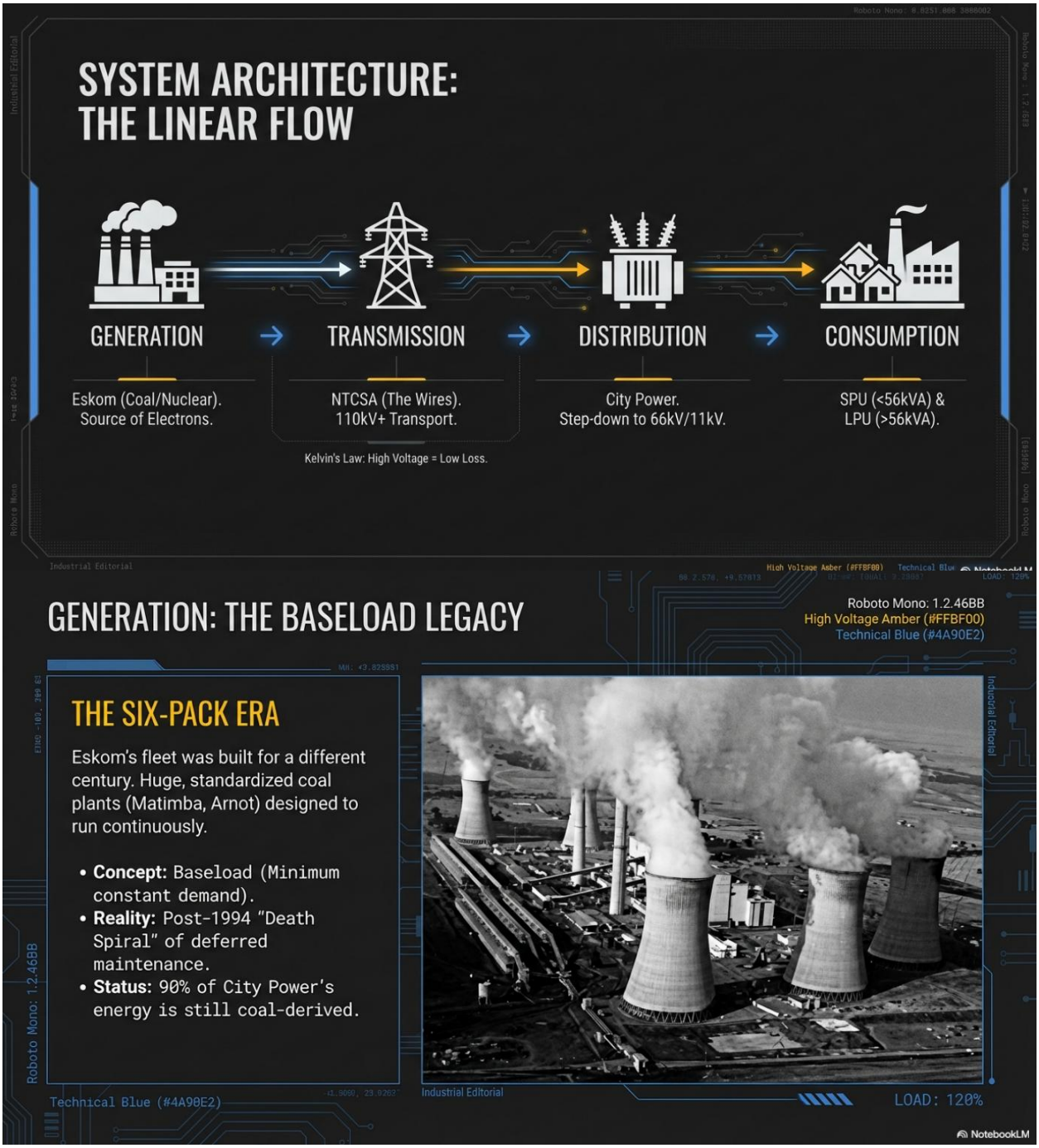

CANDIDATE SUMMARY
THE HYBRID ENGINEER
13"
A hybrid engineering professional uniquely qualified in both HEAVY CURRENT ELECTRICAL SYSTEMS and ICT/DEVOPS AUTOMATION. Proven ability to perform complex theoretical network analysis while simultaneously managing modern cloud-based deployment pipelines.
15"
OT / IT Convergence
CSD Registered & Compliant
Mathematical Rigor
Powering Business Worldwide
NotebookLM


CONTACT & AVAILABILITY
READY FOR DEPLOYMENT
NAME:
TSHINGOMBE FISTON (TSHITADI)
ROLE:
ELECTRICAL ENGINEERING | ICT SECURITY
PHONE:
+27 72 529 8946
EMAIL:
tshingombefiston@gmail.com
AREA:
JOHANNESBURG / PRETORIA
City Power
Johannesburg
Joburg
A World Class African City
EATON
NotebookLM


APPENDIX: ADVANCED CALCULATIONS
THEORETICAL EVIDENCE
$I_2 = a^2 I_1 + a I_1 + I_1$
Transient Inductance:
$L'_d = \frac{(L_{aw} + L_{kq})}{(L_{aw} + L_{kq})} + L_1$
$Z_{up} = \frac{(20 * 10^3)^2}{500 * 10^6}$
$Efficiency = \frac{P_{out}}{P_{out} + Losses}$
$Lux = \frac{(LL)(CU)(LLD)}{Area}$
$Torque = K * Flux * I_a$
CALCULATION COMPLEXITY: HIGH
EATON
Powering Business Worldwide
NotebookLM


DECENTRALIZED GRID
SMALL PRODUCERS
BIDIRECTIONAL FLOW
ACTIVE CONSUMERS
ACTIVE CONSUMERS
FROM BASELOAD TO BLACKOUTS
The Anatomy of a Crisis: A Systems-Level Analysis of Grid Dynamics through the Lens of South Africa's Energy Transition
GLOBAL CONTEXT: AI & EV Demand Surge
LOCAL REALITY: Infrastructure Collapse & Debt
NotebookLM


THE GRID IN TENSION: AN EXECUTIVE SUMMARY
THE PROTAGONISTS
ESKOM (Generation/Transmission): State monopoly. Aging Coal Fleet. R423bn Debt
CITY POWER (Distribution): Municipal entity. Buys 90% from Eskom. R200m/year theft loss.
RELIABILITY
SUSTAINABILITY
COST
LOAD: 120%
STRESS: CRITICAL
LOAD: 128%
VOLTAGE DIPS
THE CONFLICT
Global: Shift to Decentralization (Wind/Solar).
Local: Anchored in Coal & Mining Politics.
Result: The Trilemma is broken.
RELIABILITY
SUSTAINABILITY
COST
NotebookLM


SYSTEM ARCHITECTURE:
THE LINEAR FLOW
GENERATION
TRANSMISSION
DISTRIBUTION
CONSUMPTION
Eskom (Coal/Nuclear).
Source of Electrons.
NTCSA (The Wires).
110kV+ Transport.
City Power.
Step-down to 66kV/11kV.
SPU (<56kVA) &
LPU (>56kVA).
Kelvin's Law: High Voltage = Low Loss.
GENERATION: THE BASELOAD LEGACY
Roboto Mono: 1.2.46BB
High Voltage Amber (#FFBF00)
Technical Blue (#4A90E2)
THE SIX-PACK ERA
Eskom's fleet was built for a different century. Huge, standardized coal plants (Matimba, Arnot) designed to run continuously.
• Concept: Baseload (Minimum constant demand).
• Reality: Post-1994 "Death Spiral" of deferred maintenance.
• Status: 90% of City Power's energy is still coal-derived.
Industrial Editorial
Technical Blue (#4A90E2)
LOAD: 120%
NotebookLM

THE ENERGY MIX TRANSITION

SYNCHRONOUS VS. INVERTER

Moving from heavy spinning mass (stable frequency) to variable renewable energy (Solar/Wind).

IRP Goals: 14,400 MW Wind, 6,000 MW Solar PV.

Constraint: Mining sector employment & grid stability.

Strategy: Independent Power Producers (IPPs) to reduce reliance on Eskom.

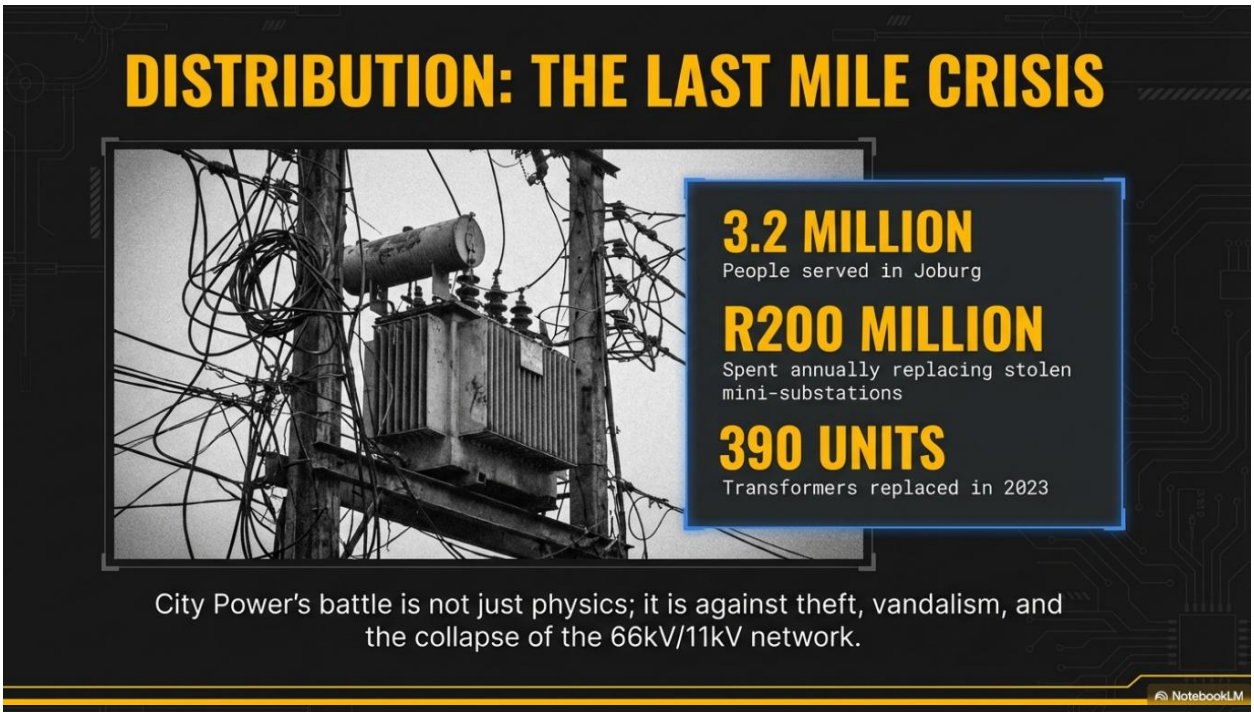
NotebookLM

TRANSMISSION: THE HIGH-VOLTAGE BACKBONE

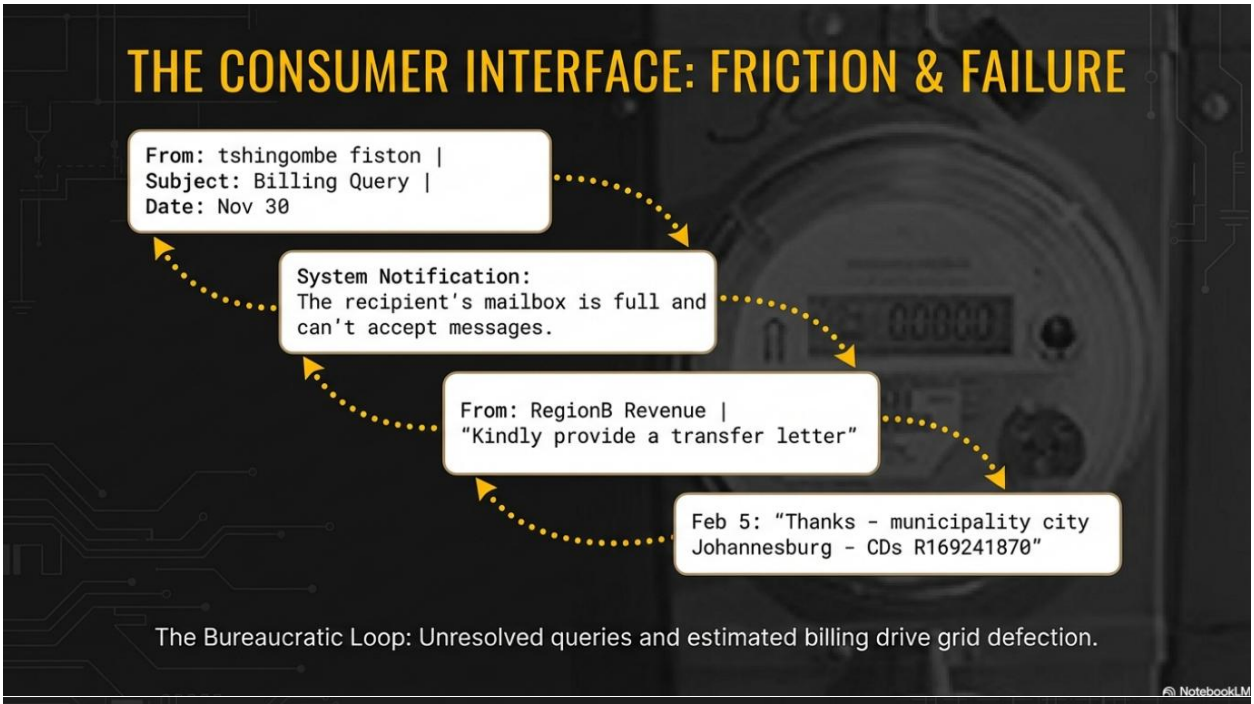
THE PHYSICS:
Kelvin's Law dictating High Voltage to minimize resistive loss.

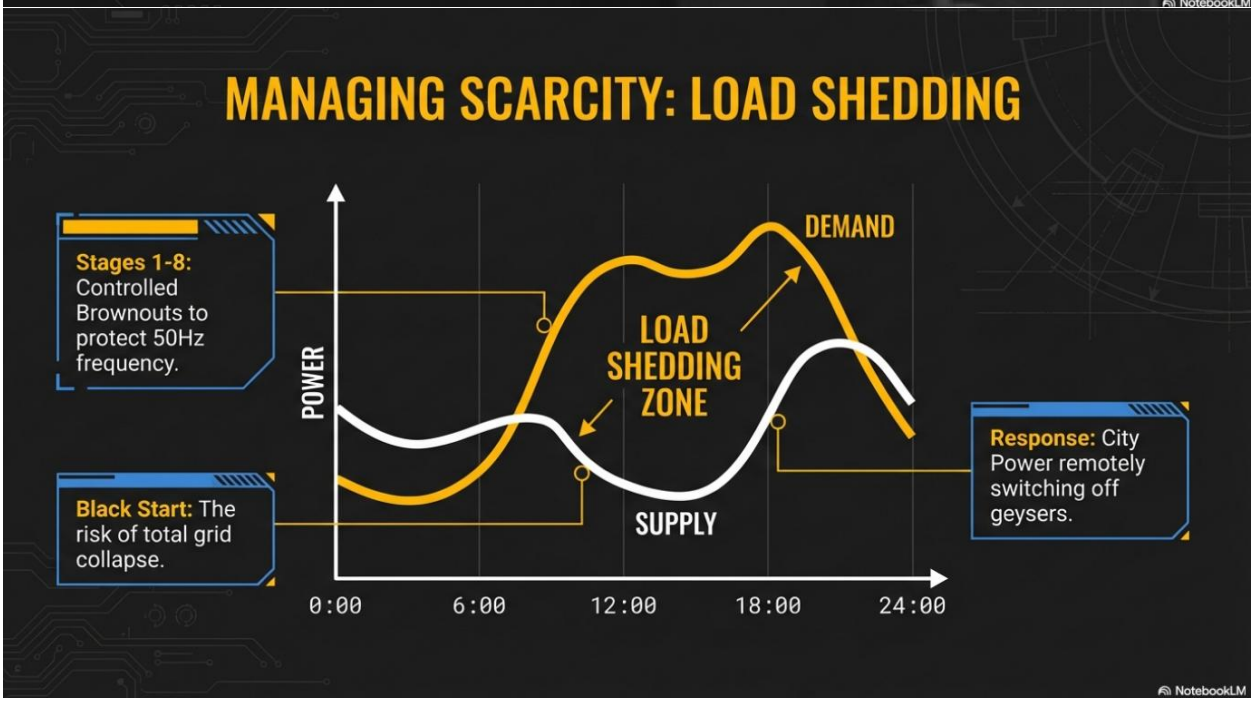
THE RISKS:
Cascading Failures.

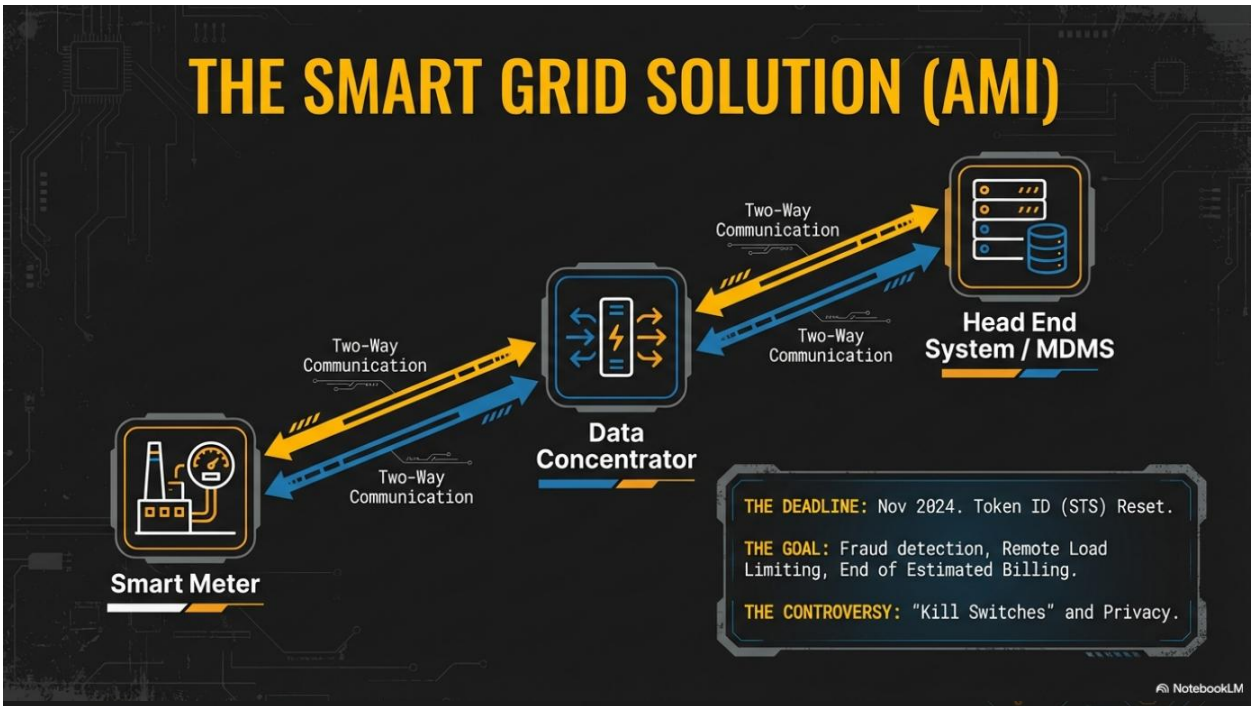
Entity:
National Transmission Company of SA (NTCSA) - Separating the "Wires" from the "Generation".

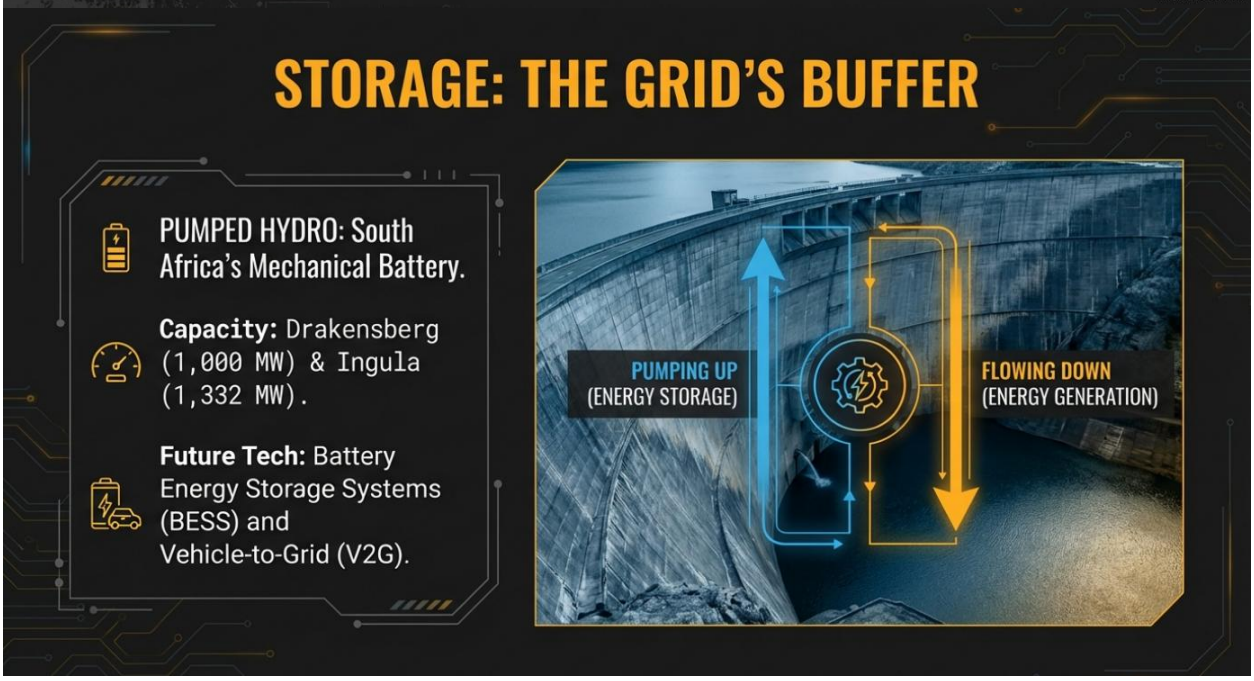

DISTRIBUTION: THE LAST MILE CRISIS
3.2 MILLION
People served in Joburg
R200 MILLION
Spent annually replacing stolen mini-substations
390 UNITS
Transformers replaced in 2023
City Power's battle is not just physics; it is against theft, vandalism, and the collapse of the 66kV/11kV network.
NotebookLM

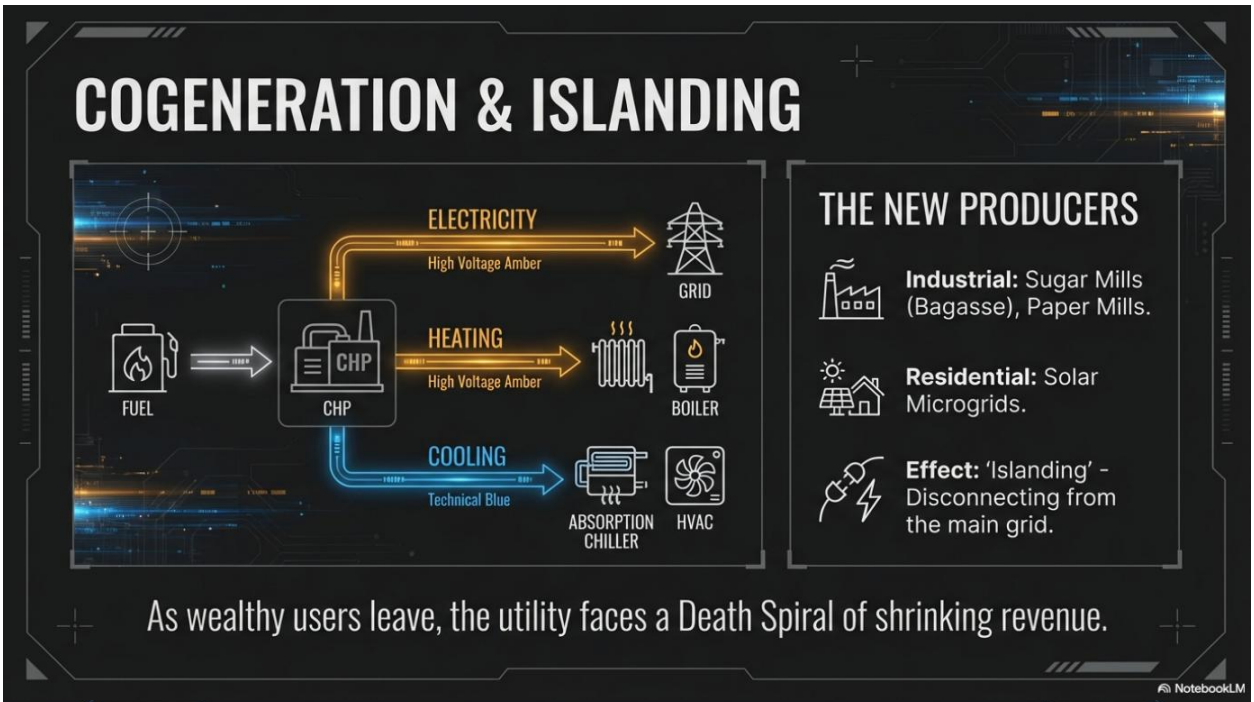
OPERATIONAL RISKS: SABOTAGE & EXTRACTION
TOP SECRET
CLASSIFIED
CORRUPTION CASE FILE
Oswald
LETHABO INCIDENT
Severed steel supports on coal conveyor (Nov 2021). Deliberate sabotage.
Date: NOV 2021
Type: SABOTAGE
Impact: CRITICAL INFRASTRUCTURE DAMAGE
EVIDENCE #01
High Voltage Amber
SYSTEMIC RISK
STATE CAPTURE
R1.6bn extracted by Trillian Capital. R11.7bn in irregular coal contracts.
R1.6 BN EXTRACTED (TRILLIAN)
R11.7 BN IRREGULAR CONTRACTS
Status: ONGOING INVESTIGATION
Oswald
DEBT CRISIS
City Power ordered by High Court to pay Eskom R1 billion immediately (June 2024).
AMOUNT: R1 BILLION
DEADLINE: IMMEDIATELY (JUNE 2024)
Court Order: HIGH COURT
EVIDENCE #03
The greatest threats are not technical failures, but organized crime, political interference, and systemic corruption actively dismantling the grid.
NotebookLM

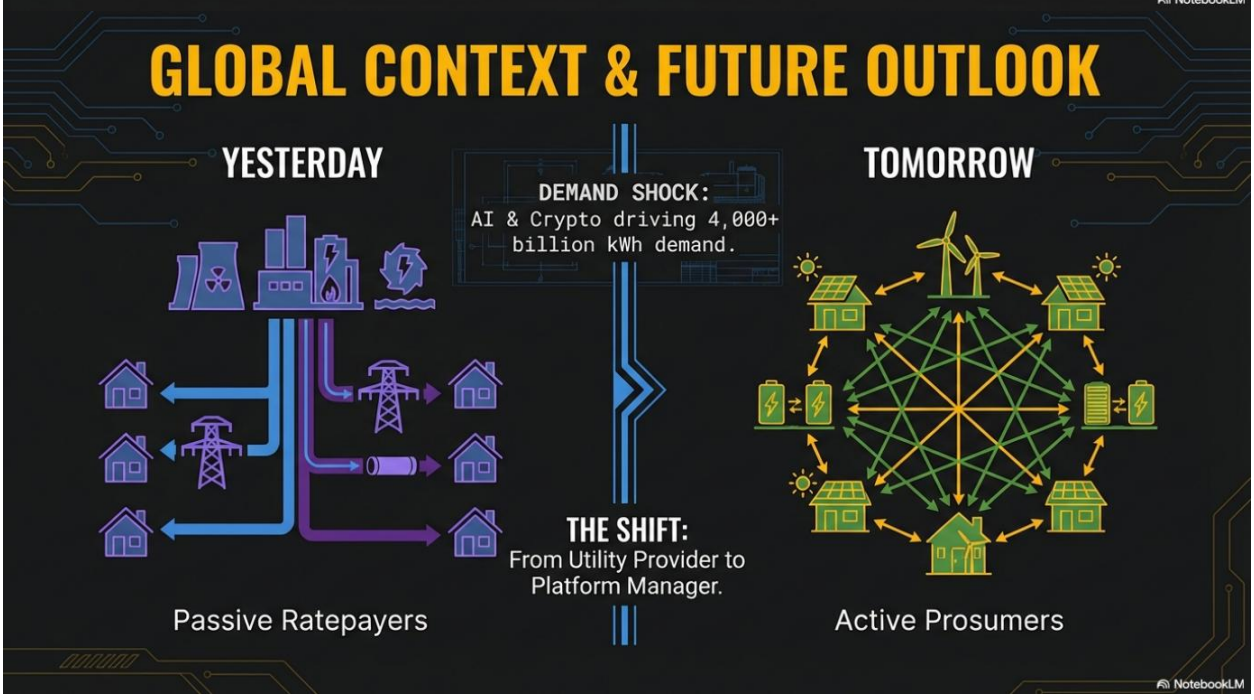

THE CONSUMER INTERFACE: FRICTION & FAILURE
From: tshingombe fiston |
Subject: Billing Query |
Date: Nov 30
System Notification:
The recipient's mailbox is full and can't accept messages.
From: RegionB Revenue |
"Kindly provide a transfer letter"
Feb 5: "Thanks - municipality city Johannesburg - CDs R169241870"
The Bureaucratic Loop: Unresolved queries and estimated billing drive grid defection.
NotebookLM

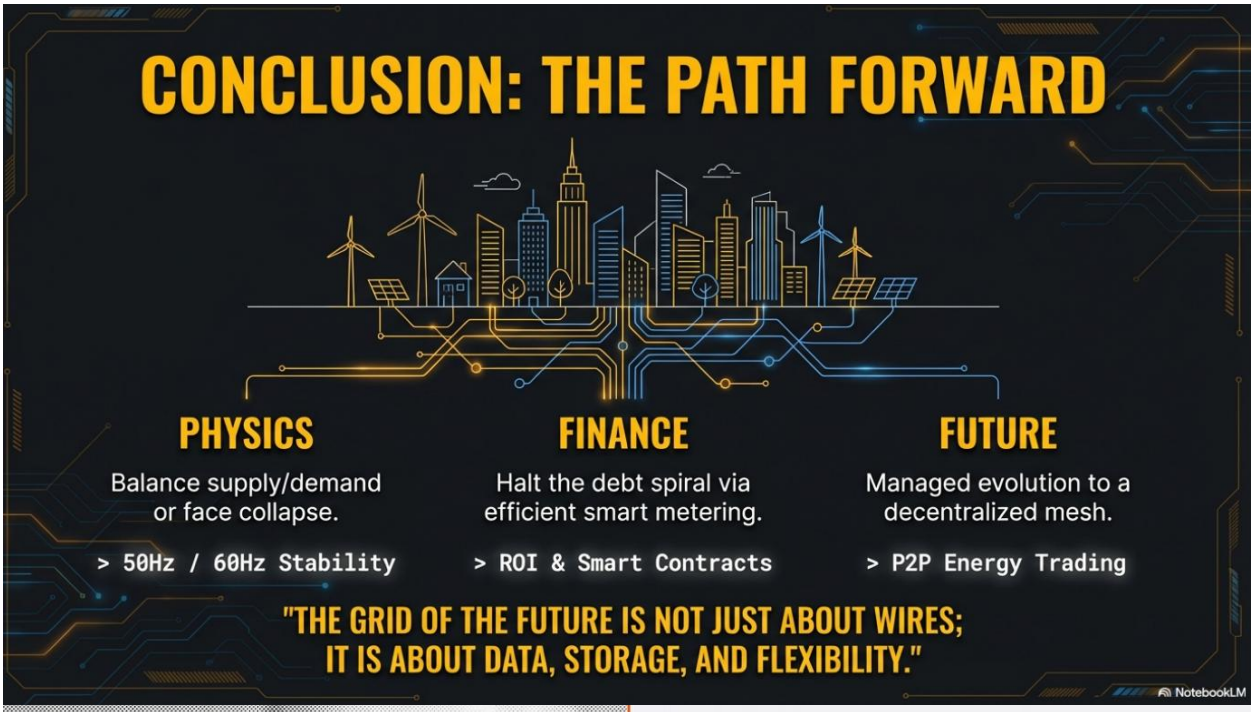

MANAGING SCARCITY: LOAD SHEDDING
Stages 1-8: Controlled Brownouts to protect 50Hz frequency.
Black Start: The risk of total grid collapse.
POWER
DEMAND
LOAD SHEDDING ZONE
SUPPLY
Response: City Power remotely switching off geysers.
0:00
6:00
12:00
18:00
24:00
NotebookLM

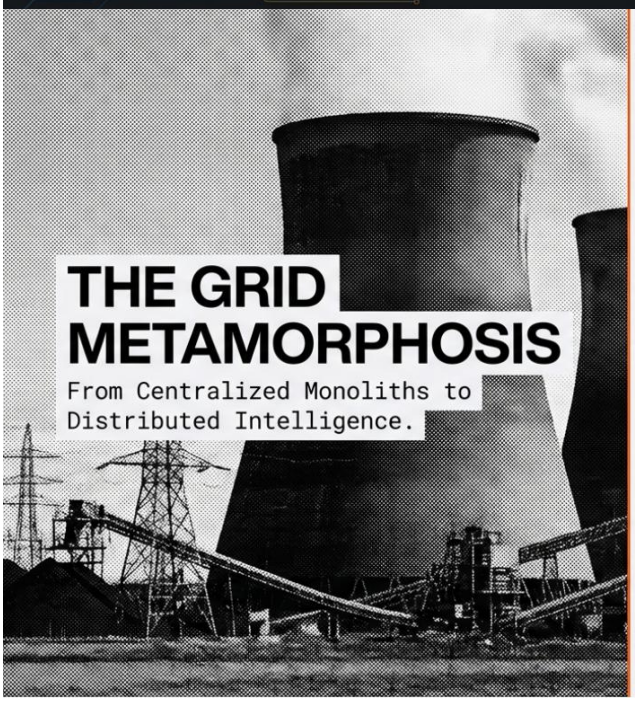

THE SMART GRID SOLUTION (AMI)
Two-Way Communication
Two-Way Communication
Two-Way Communication
Two-Way Communication
Head End System / MDMS
Data Concentrator
Smart Meter
THE DEADLINE: Nov 2024. Token ID (STS) Reset.
THE GOAL: Fraud detection, Remote Load Limiting, End of Estimated Billing.
THE CONTROVERSY: "Kill Switches" and Privacy.
NotebookLM


STORAGE: THE GRID'S BUFFER
PUMPED HYDRO: South Africa's Mechanical Battery.
Capacity: Drakensberg (1,000 MW) & Ingula (1,332 MW).
Future Tech: Battery Energy Storage Systems (BESS) and Vehicle-to-Grid (V2G).
PUMPING UP (ENERGY STORAGE)
FLOWING DOWN (ENERGY GENERATION)


COGENERATION & ISLANDING
ELECTRICITY
High Voltage Amber
GRID
FUEL
CHP
CHP
HEATING
High Voltage Amber
BOILER
COOLING
Technical Blue
ABSORPTION CHILLER
HVAC
THE NEW PRODUCERS
Industrial: Sugar Mills (Bagasse), Paper Mills.
Residential: Solar Microgrids.
Effect: 'Islanding' - Disconnecting from the main grid.
As wealthy users leave, the utility faces a Death Spiral of shrinking revenue.
NotebookLM


GLOBAL CONTEXT & FUTURE OUTLOOK
YESTERDAY
DEMAND SHOCK:
AI & Crypto driving 4,000+ billion kWh demand.
TOMORROW
THE SHIFT:
From Utility Provider to Platform Manager.
Passive Ratepayers
Active Prosumers
NotebookLM

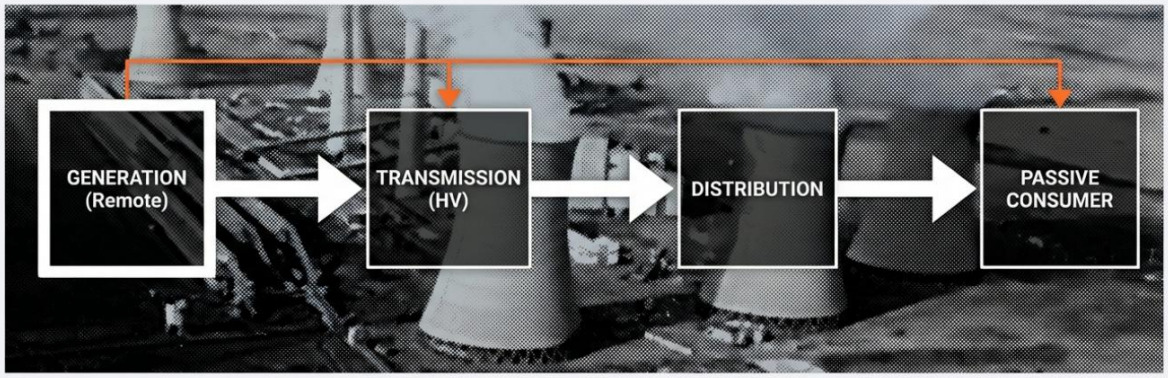

CONCLUSION: THE PATH FORWARD
PHYSICS
Balance supply/demand or face collapse.
> 50Hz / 60Hz Stability
FINANCE
Halt the debt spiral via efficient smart metering.
> ROI & Smart Contracts
FUTURE
Managed evolution to a decentralized mesh.
> P2P Energy Trading
"THE GRID OF THE FUTURE IS NOT JUST ABOUT WIRES; IT IS ABOUT DATA, STORAGE, AND FLEXIBILITY."
NotebookLM


THE GRID METAMORPHOSIS
From Centralized Monoliths to Distributed Intelligence.

Global Infrastructure Analysis
Transition Status: CRITICAL
NotebookLM

THE LOGIC OF THE MONOLITH

Economies of Scale & Base Load Theory



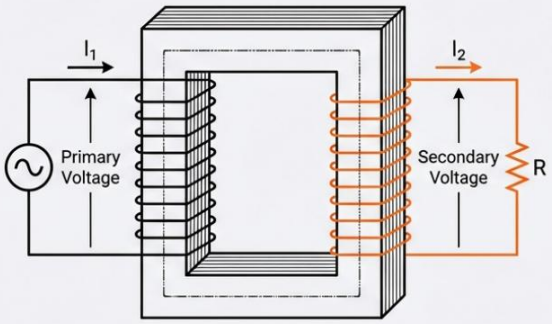
ERA:
1960–1990 Expansion.

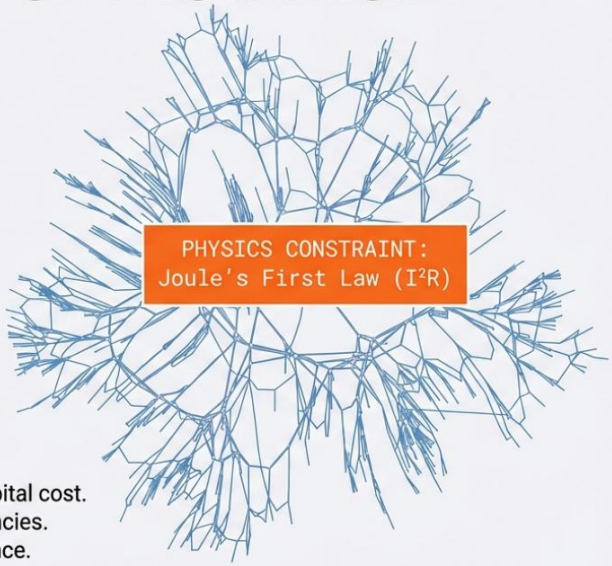
DESIGN:
The 'Six-Pack' Standard (6x Large Generator Units).

PHILOSOPHY:
Base Load efficiency via massive scale.

NotebookLM

THE TYRANNY OF DISTANCE



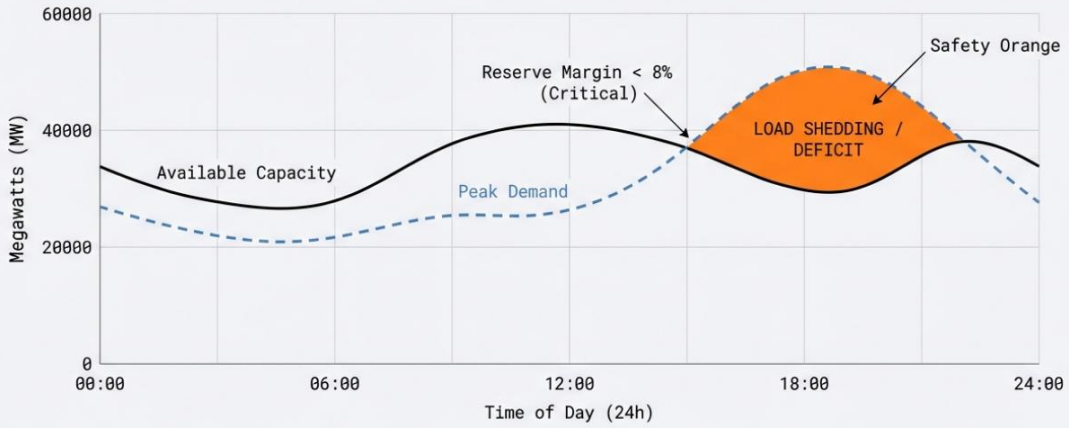


- Energy loss is proportional to the square of the current.
- Kelvin's Law: Balancing wasted energy vs. conductor capital cost.
- The Skin Effect: Resistance increases at high AC frequencies.
- **Solution**: Step-up voltage to minimize current over distance.

NotebookLM

THE BREAKING POINT

When Demand Outstrips Supply

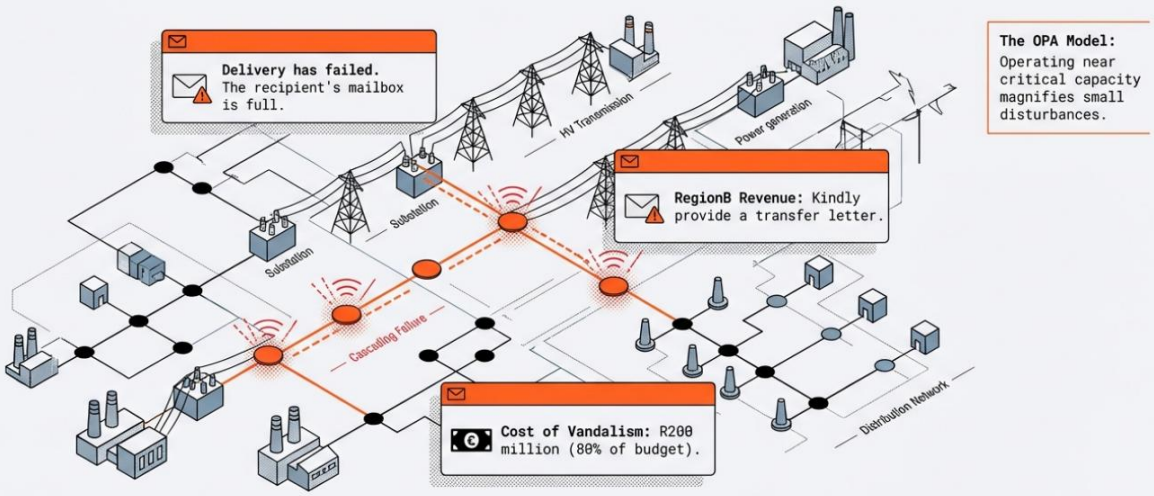


Load Shedding: A controlled mechanism to prevent total grid collapse (Black Start scenario).

NotebookLM

Engineering Editorial

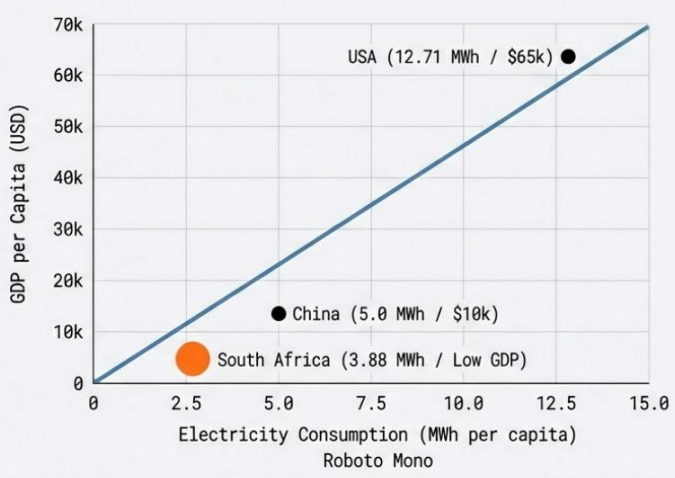
ANATOMY OF FAILURE: CITY POWER CASE STUDY

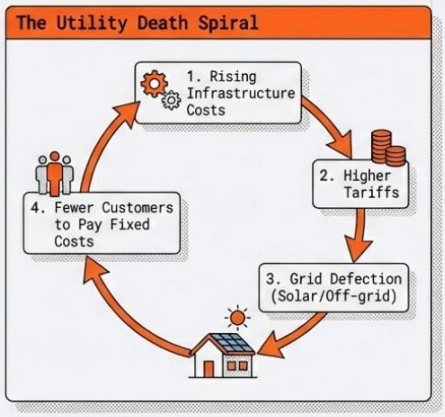


NotebookLM

THE ECONOMIC EQUATION

in Ink Black Helvetica Now Display



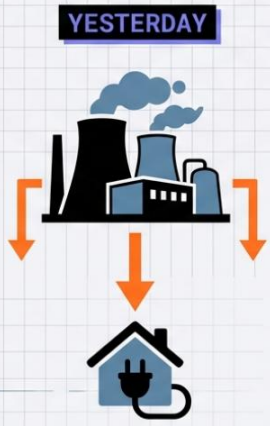

The Utility Death Spiral
1. Rising Infrastructure Costs
2. Higher Tariffs
3. Grid Defection (Solar/Off-grid)
4. Fewer Customers to Pay Fixed Costs

NotebookLM

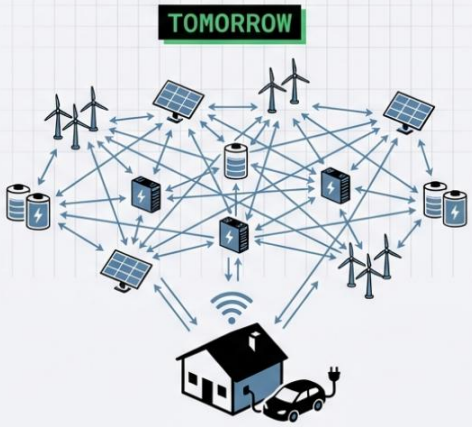
Engineering Editorial

ENTER THE SMART GRID

From Dumb Pipe to Digital Nervous System

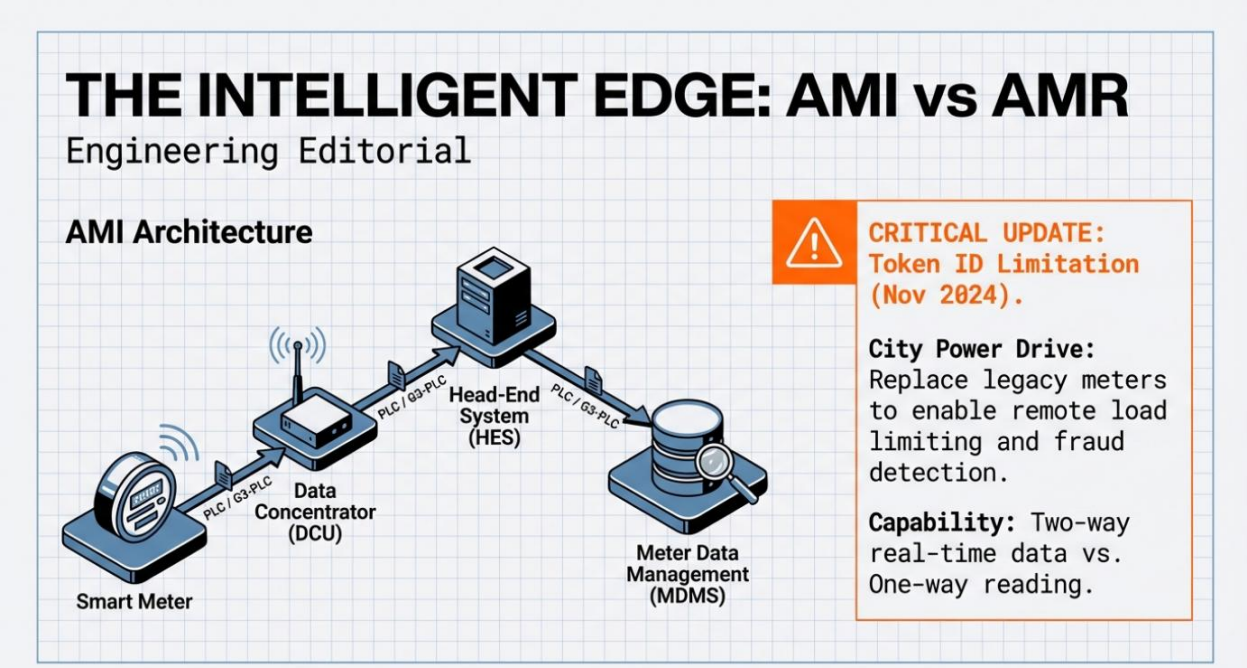


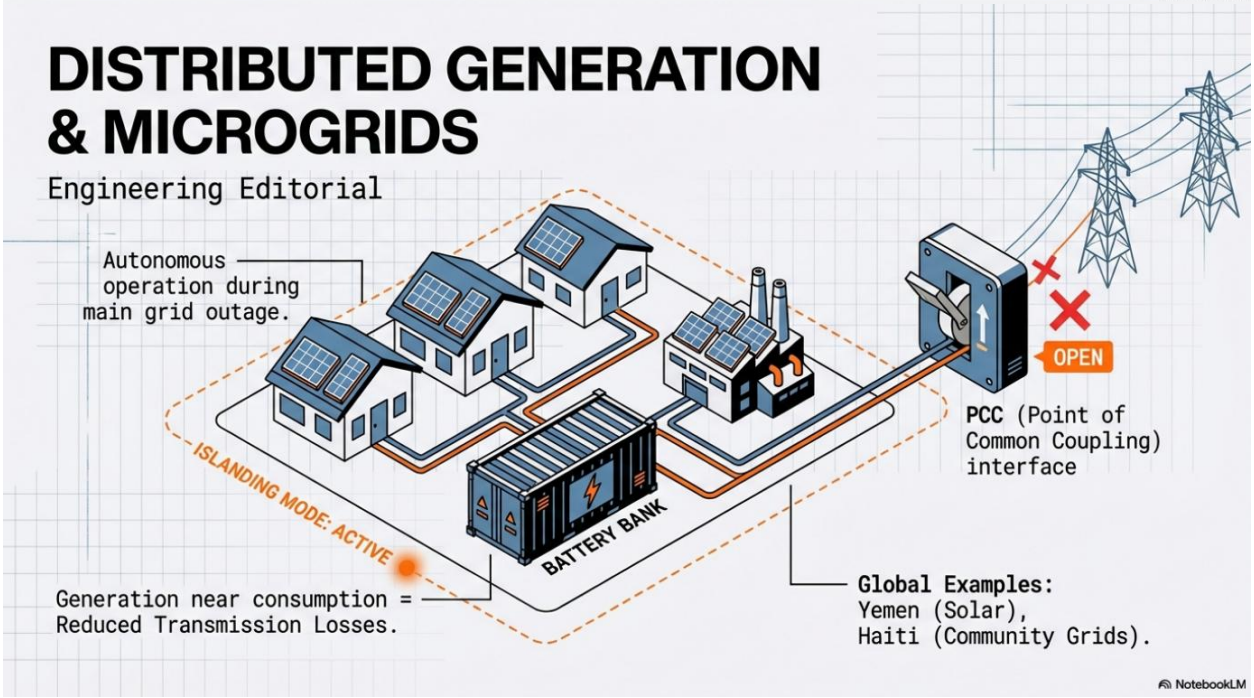
One-Way / Passive / Centralized

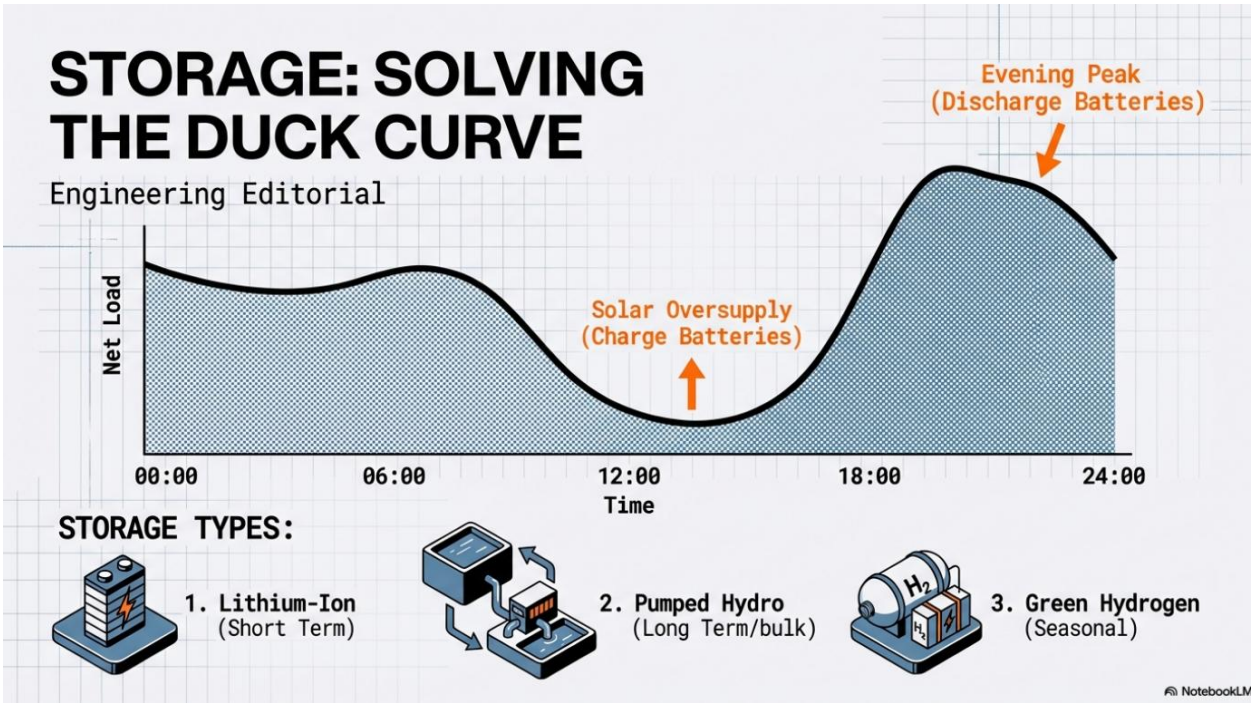


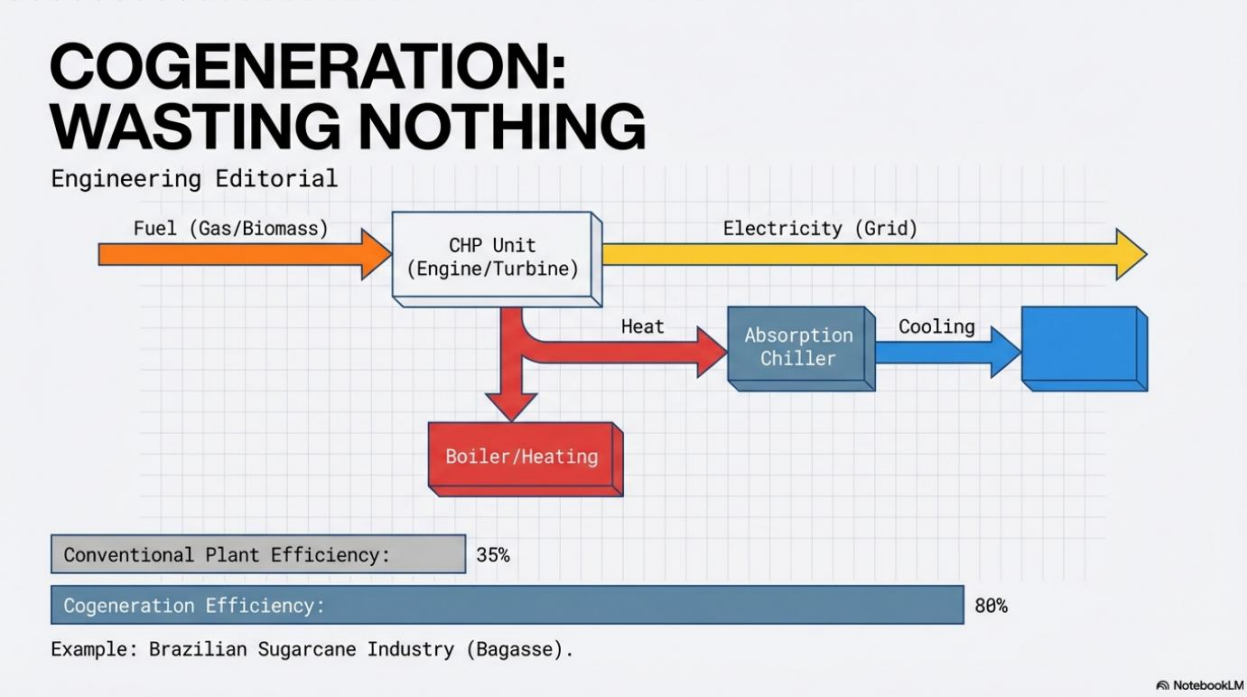
Two-Way / Active / Decentralized

NotebookLM


THE INTELLIGENT EDGE: AMI vs AMR
Engineering Editorial
AMI Architecture
Smart Meter
PLC / G3-PLC
Data Concentrator (DCU)
PLC / G3-PLC
Head-End System (HES)
PLC / G3-PLC
Meter Data Management (MDMS)
CRITICAL UPDATE: Token ID Limitation (Nov 2024).
City Power Drive: Replace legacy meters to enable remote load limiting and fraud detection.
Capability: Two-way real-time data vs. One-way reading.
NotebookLM

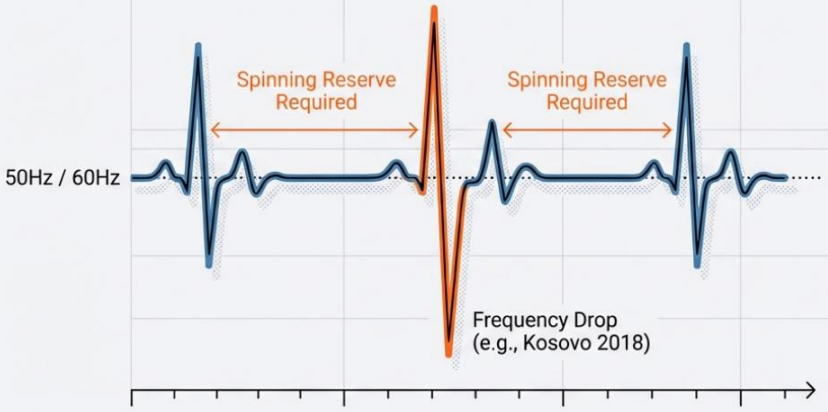

DISTRIBUTED GENERATION & MICROGRIDS
Engineering Editorial
Autonomous operation during main grid outage.
ISLANDING MODE: ACTIVE
BATTERY BANK
OPEN
PCC (Point of Common Coupling) interface
Generation near consumption = Reduced Transmission Losses.
Global Examples: Yemen (Solar), Haiti (Community Grids).
NotebookLM


STORAGE: SOLVING THE DUCK CURVE
Engineering Editorial
Evening Peak (Discharge Batteries)
Net Load
Solar Oversupply (Charge Batteries)
00:00
06:00
12:00
18:00
24:00
Time
STORAGE TYPES:
1. Lithium-Ion (Short Term)
2. Pumped Hydro (Long Term/bulk)
3. Green Hydrogen (Seasonal)
NotebookLM


COGENERATION: WASTING NOTHING
Engineering Editorial
Fuel (Gas/Biomass)
CHP Unit (Engine/Turbine)
Electricity (Grid)
Heat
Absorption Chiller
Cooling
Boiler/Heating
Conventional Plant Efficiency:
35%
Cogeneration Efficiency:
80%
Example: Brazilian Sugarcane Industry (Bagasse).
NotebookLM

THE RENEWABLE INTEGRATION CHALLENGE

Firm vs. Variable Capacity



Variable Sources (Wind/Solar) lack inertia.

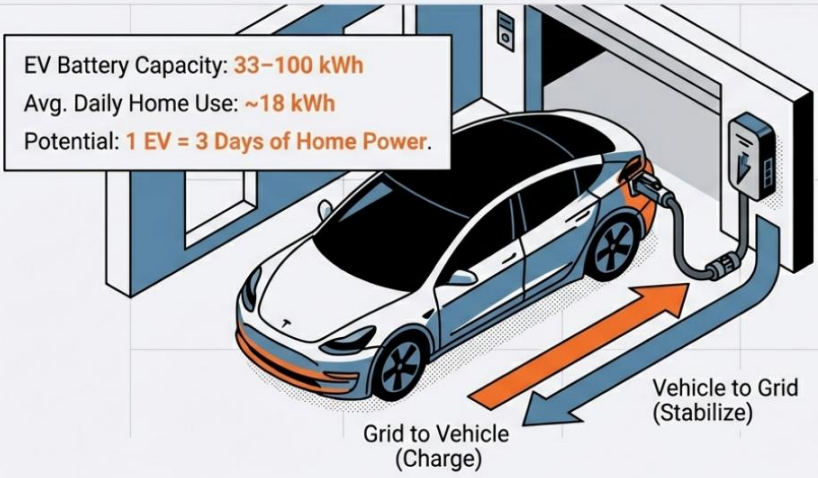
Firm Capacity (Coal/Nuclear) provides baseload.

South African Transition Deal: Funding coal exit vs. Mining employment risk.

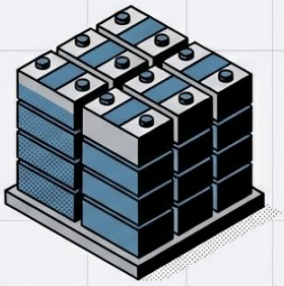
NotebookLM

THE NEW CONSUMER: EVs and V2G

Engineering Editorial

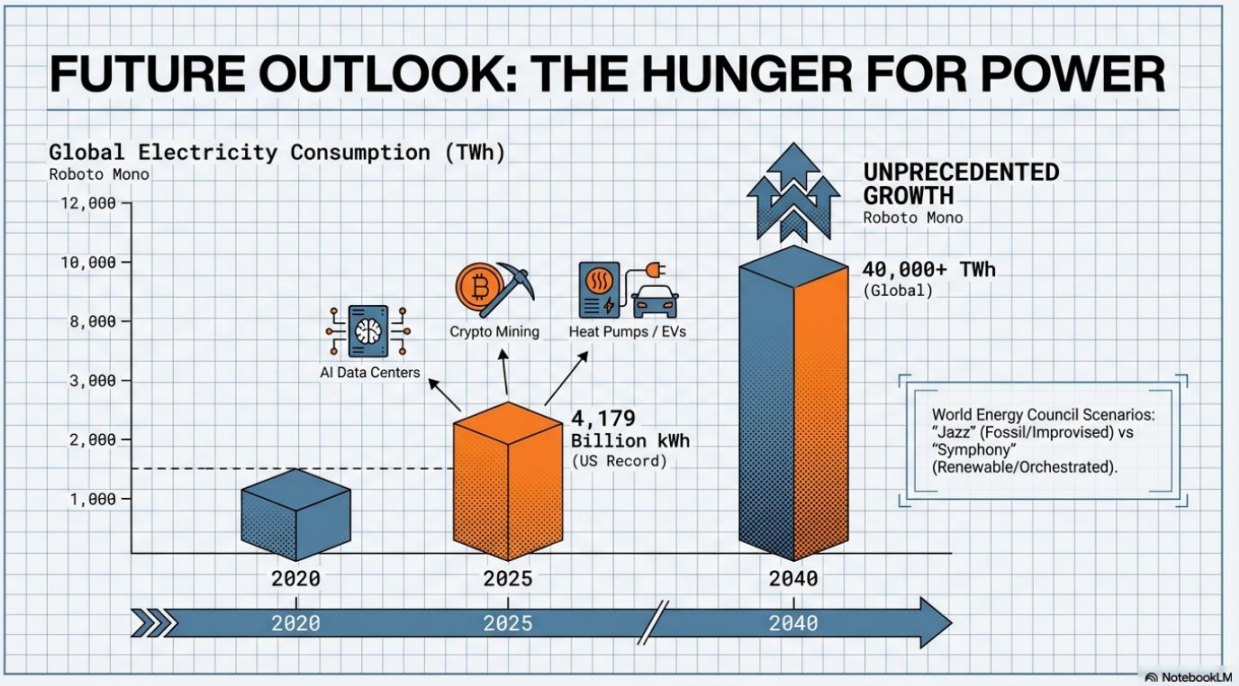

EV Battery Capacity: 33–100 kWh
Avg. Daily Home Use: ~18 kWh
Potential: 1 EV = 3 Days of Home Power.
Vehicle to Grid (Stabilize)
Grid to Vehicle (Charge)

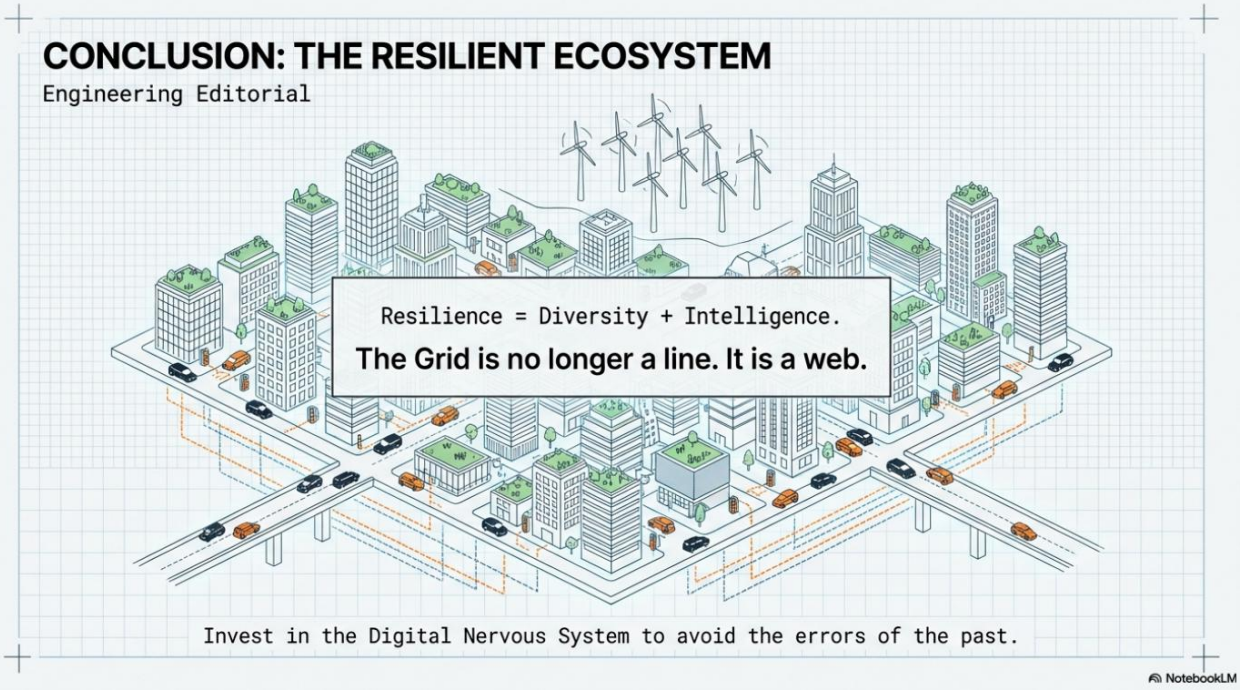
Second-Life Storage (Retire @ 80% Capacity)

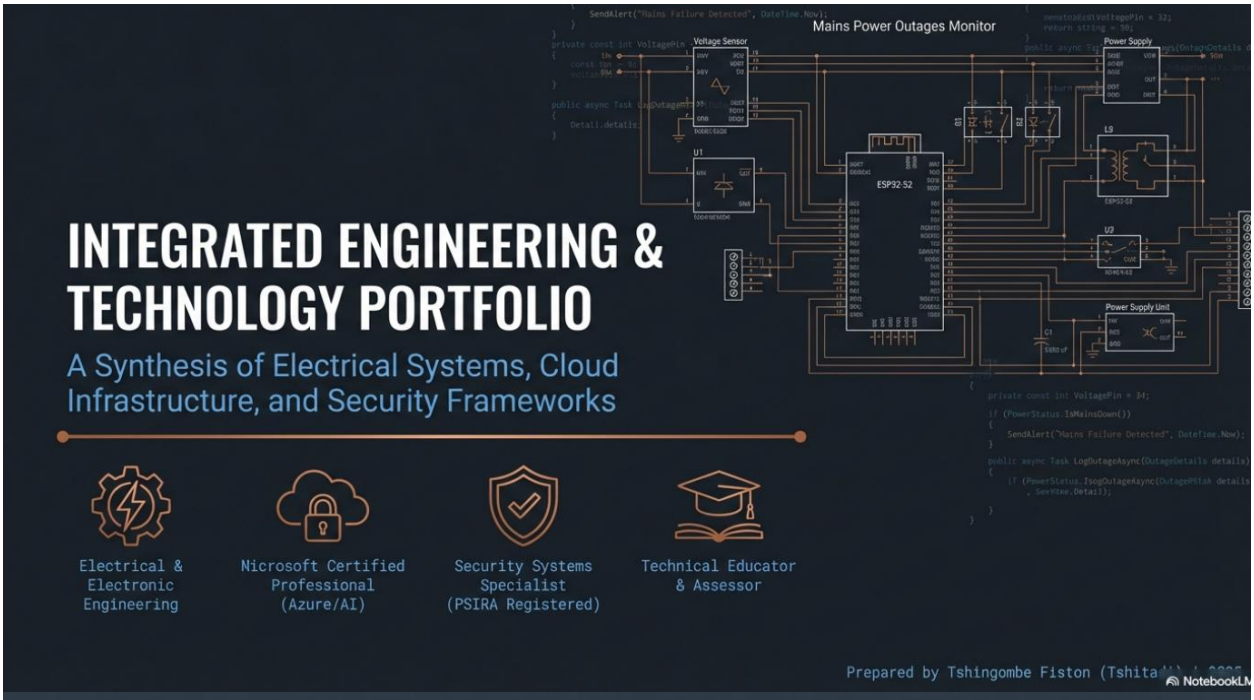


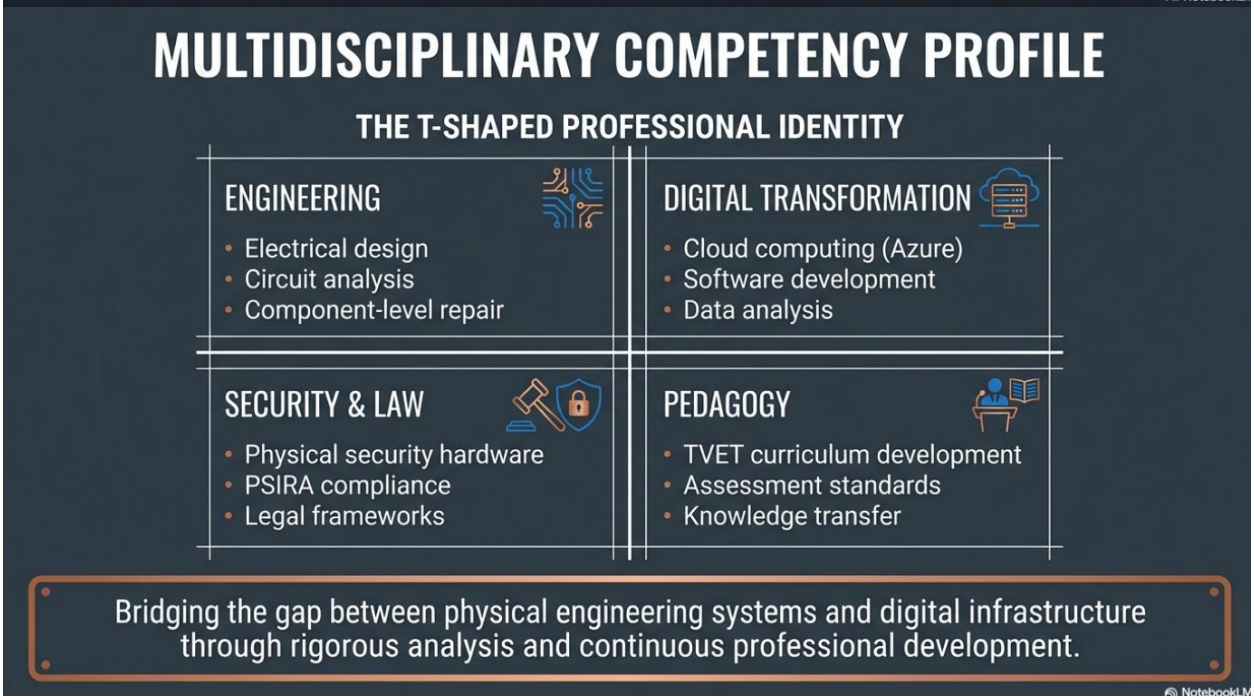
Example: Nissan Leaf batteries repurposing initiatives.

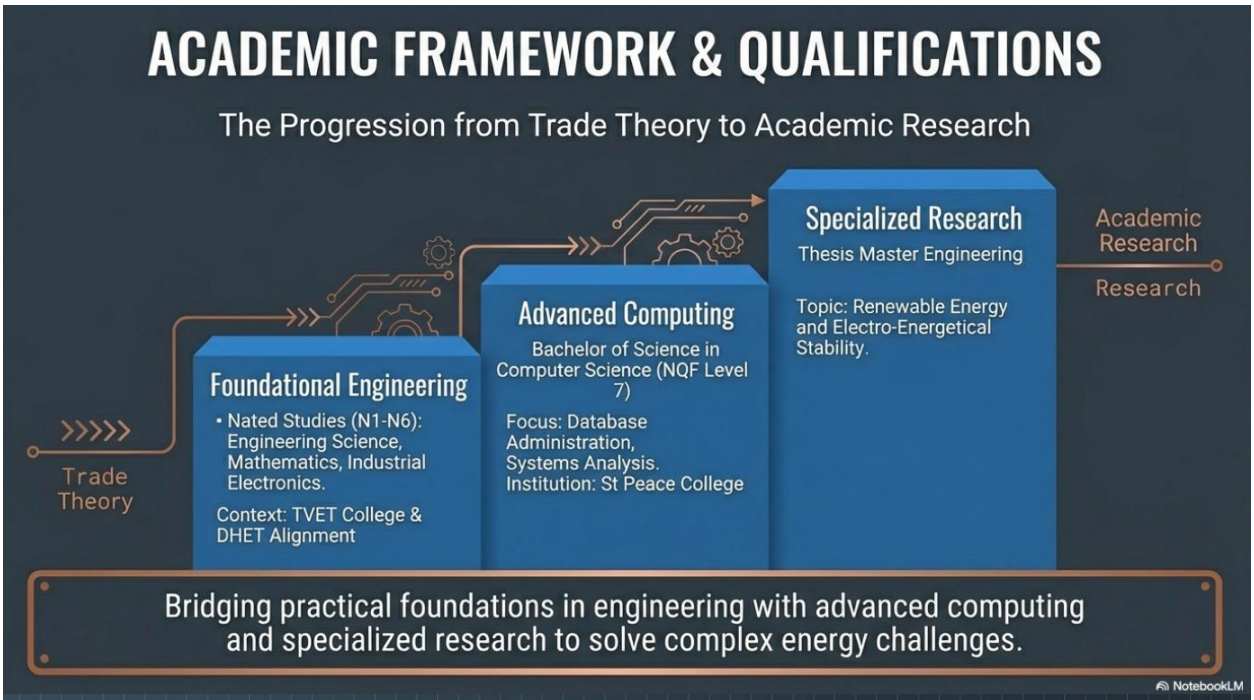
NotebookLM

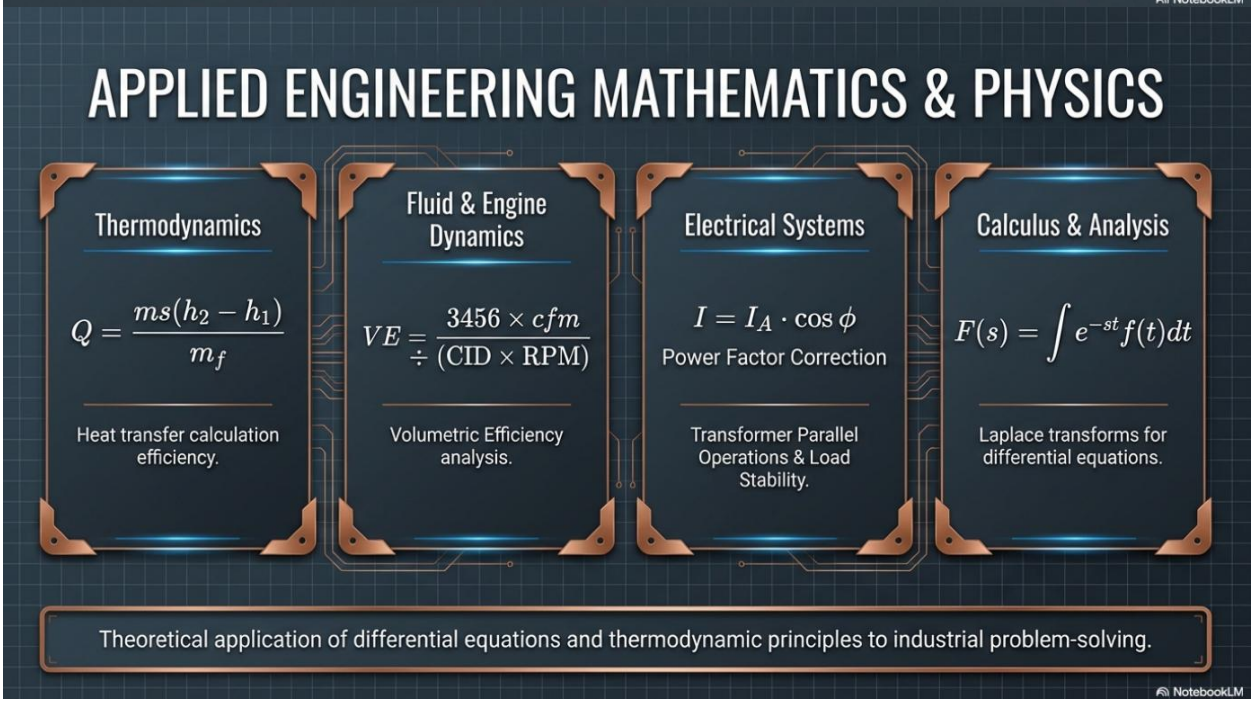

FUTURE OUTLOOK: THE HUNGER FOR POWER
Global Electricity Consumption (TWh)
Roboto Mono
12,000
10,000
8,000
3,000
2,000
1,000
AI Data Centers
Crypto Mining
Heat Pumps / EVs
4,179
Billion kWh
(US Record)
UNPRECEDENTED
GROWTH
Roboto Mono
40,000+ TWh
(Global)
World Energy Council Scenarios:
"Jazz" (Fossil/Improvised) vs
"Symphony"
(Renewable/Orchestrated).
2020
2025
2040
2020
2025
2040
NotebookLM


CONCLUSION: THE RESILIENT ECOSYSTEM
Engineering Editorial
Resilience = Diversity + Intelligence.
The Grid is no longer a line. It is a web.
Invest in the Digital Nervous System to avoid the errors of the past.
NotebookLM


Mains Power Outages Monitor
INTEGRATED ENGINEERING & TECHNOLOGY PORTFOLIO
A Synthesis of Electrical Systems, Cloud Infrastructure, and Security Frameworks
Electrical & Electronic Engineering
Nicrosoft Certified Professional (Azure/AI)
Security Systems Specialist (PSIRA Registered)
Technical Educator & Assessor
Prepared by Tshingombe Fiston (Tshita


MULTIDISCIPLINARY COMPETENCY PROFILE
THE T-SHAPED PROFESSIONAL IDENTITY
ENGINEERING
• Electrical design
• Circuit analysis
• Component-level repair
DIGITAL TRANSFORMATION
• Cloud computing (Azure)
• Software development
• Data analysis
SECURITY & LAW
• Physical security hardware
• PSIRA compliance
• Legal frameworks
PEDAGOGY
• TVET curriculum development
• Assessment standards
• Knowledge transfer
Bridging the gap between physical engineering systems and digital infrastructure through rigorous analysis and continuous professional development.


ACADEMIC FRAMEWORK & QUALIFICATIONS
The Progression from Trade Theory to Academic Research
Trade Theory
Foundational Engineering
• Nated Studies (N1-N6): Engineering Science, Mathematics, Industrial Electronics.
Context: TVET College & DHET Alignment
Advanced Computing
Bachelor of Science in Computer Science (NQF Level 7)
Focus: Database Administration, Systems Analysis.
Institution: St Peace College
Specialized Research
Thesis Master Engineering
Topic: Renewable Energy and Electro-Energetical Stability.
Academic Research
Research
Bridging practical foundations in engineering with advanced computing and specialized research to solve complex energy challenges.
NotebookLM

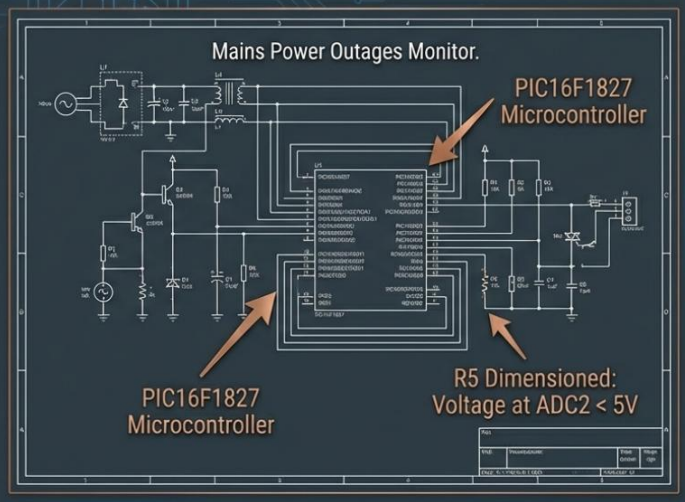

APPLIED ENGINEERING MATHEMATICS & PHYSICS
Thermodynamics
$Q = \frac{ms(h_2 - h_1)}{m_f}$
Heat transfer calculation efficiency.
Fluid & Engine Dynamics
$VE = \frac{3456 \times cfm}{\div (\text{CID} \times \text{RPM})}$
Volumetric Efficiency analysis.
Electrical Systems
$I = I_A \cdot \cos\phi$
Power Factor Correction
Transformer Parallel Operations & Load Stability.
Calculus & Analysis
$F(s) = \int e^{-st} f(t) dt$
Laplace transforms for differential equations.
Theoretical application of differential equations and thermodynamic principles to industrial problem-solving.
NotebookLM

CIRCUIT DESIGN & HARDWARE IMPLEMENTATION

Project A: Mains Power Monitor
- Dual Architecture: Analog vs. Digital versions.
- Logic: Precision voltage sensing.

Project B: Brushed DC Motor Control
- Method: EMF Measurement (Tacholess).
- PWM Frequency: N=64, 245Hz.

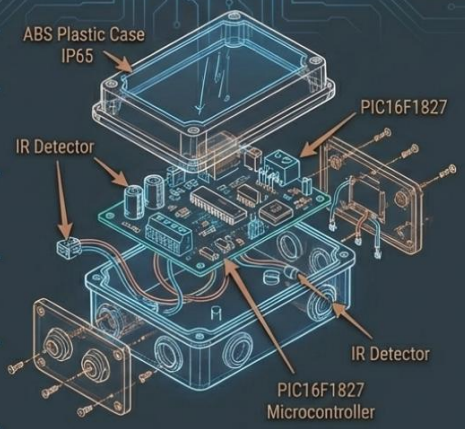
Project C: Intelligent Dimmer
- Integration: PIC18F1320, Triac, IR Detector.



NotebookLM

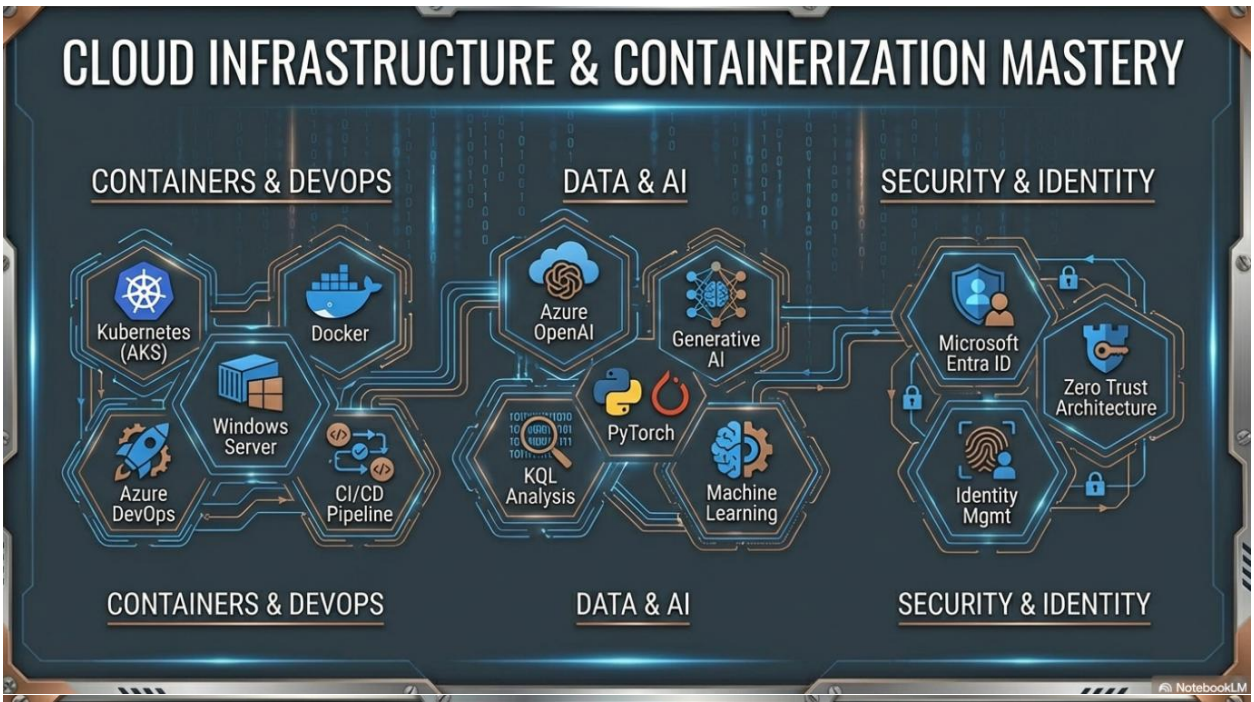
COMPONENT LEVEL ENGINEERING & BILL OF MATERIALS

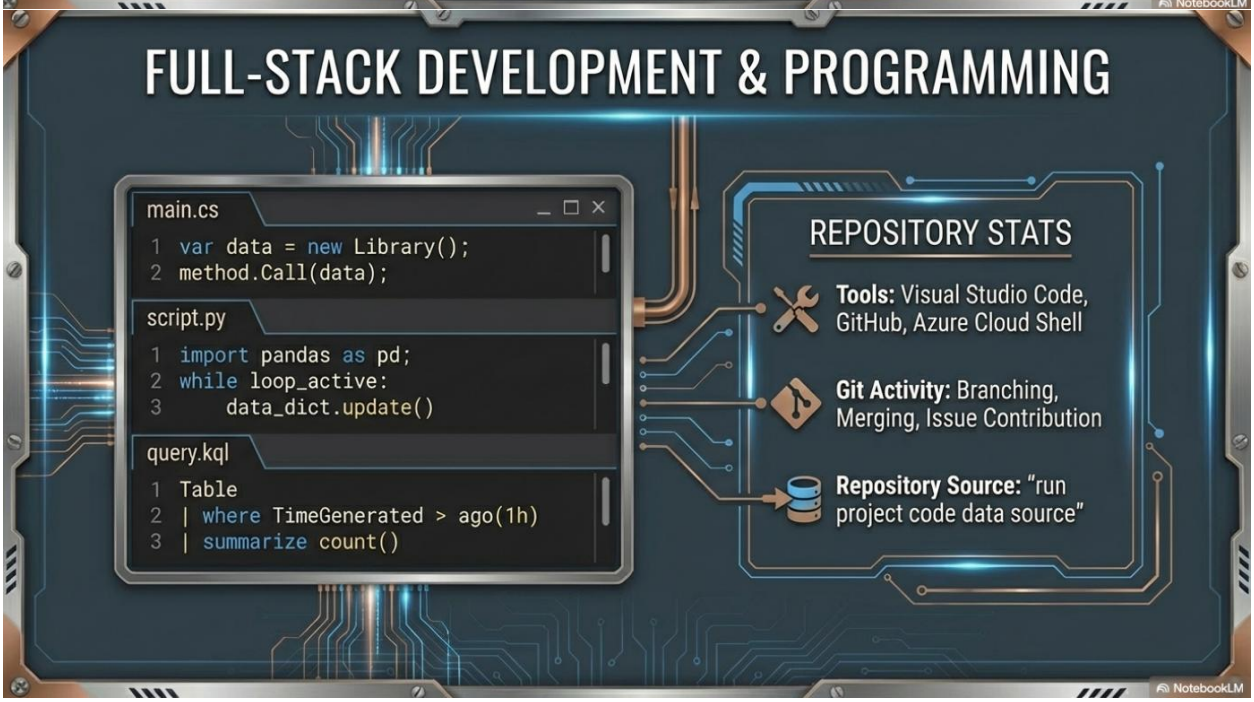
Category	Component	Specification
Semiconductors	1N4004 Diode, PIC16F1827	IRF4905, Mercury Rectifiers
Passives	Radial Electrolytic Capacitors	2200uF 16V, 470k Ohm (0.24w)
Enclosure	ABS Plastic Case	IP65 Sealed / Weatherproof
Sensors	IR Detector	Photo-flash response

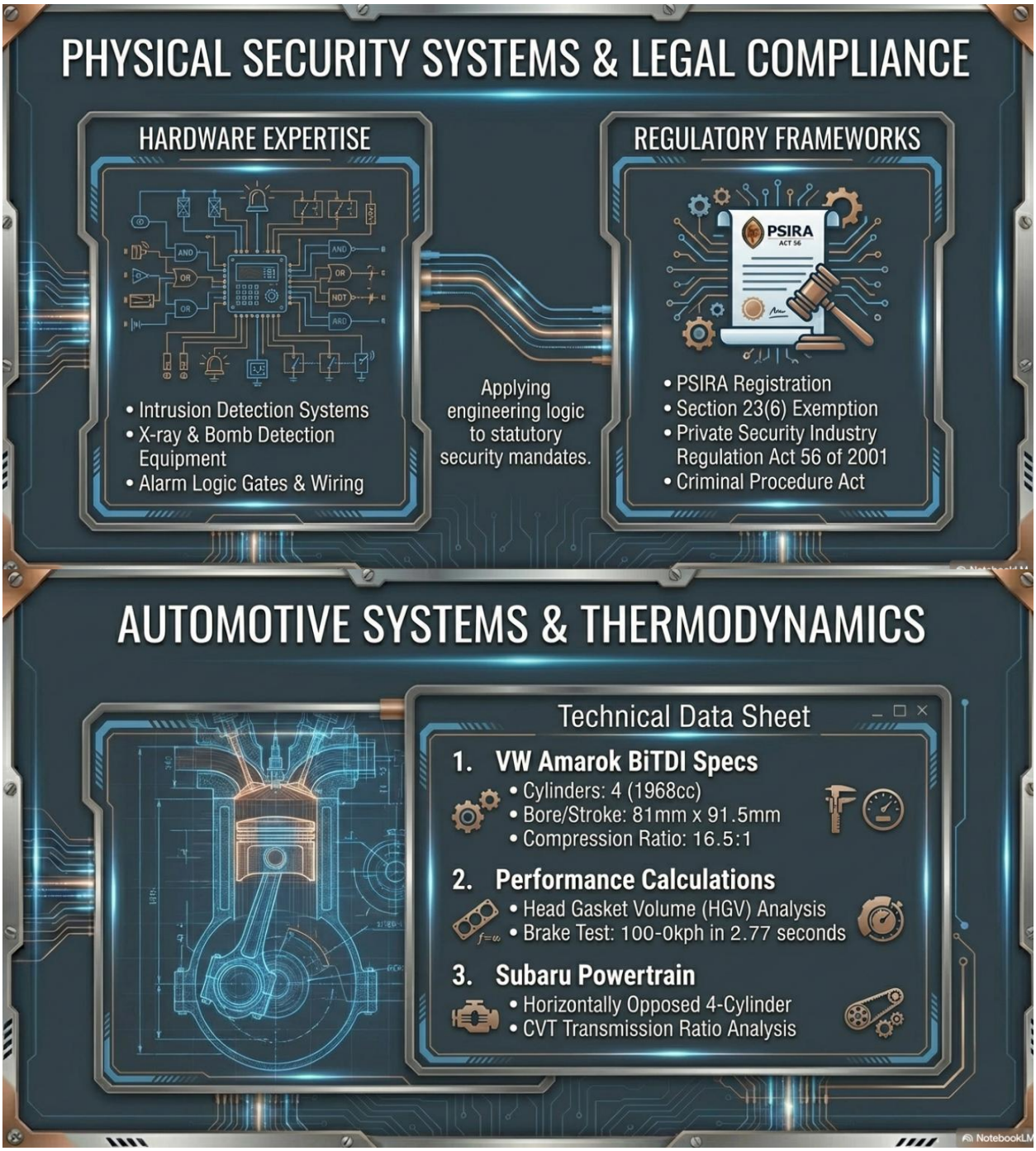


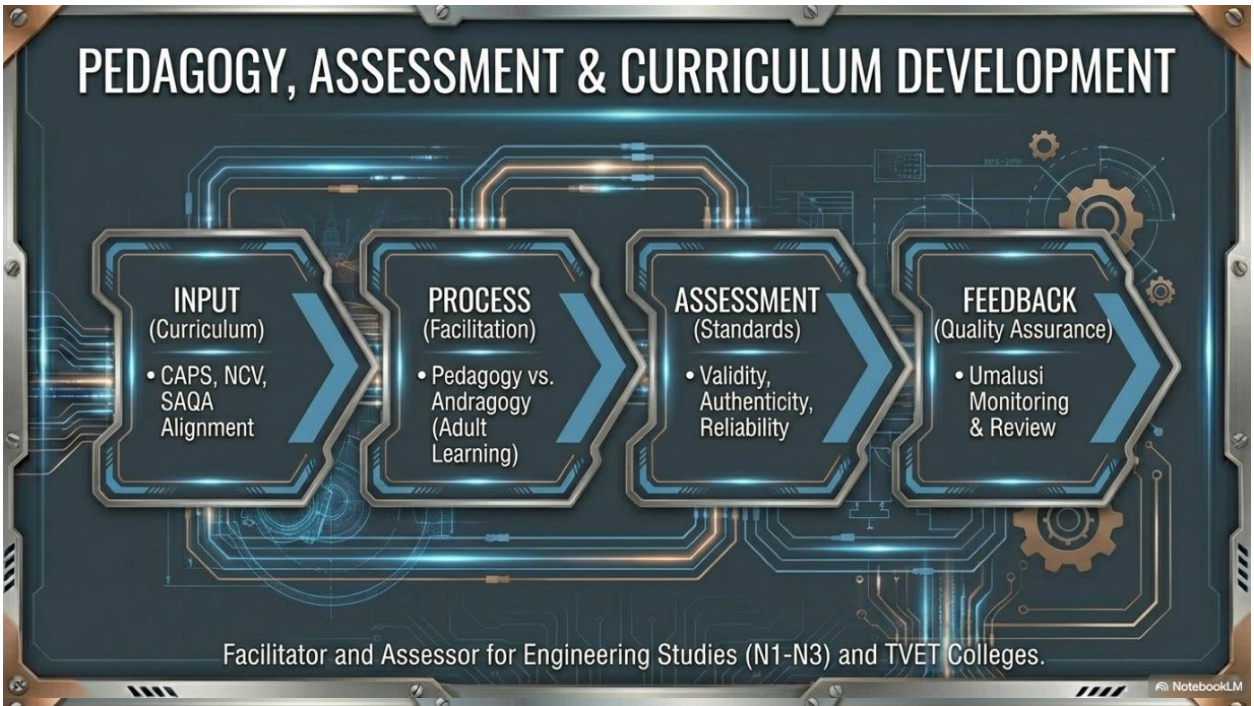
Procurement and assembly of precision components for projects ranging from flash triggers to weather loggers.

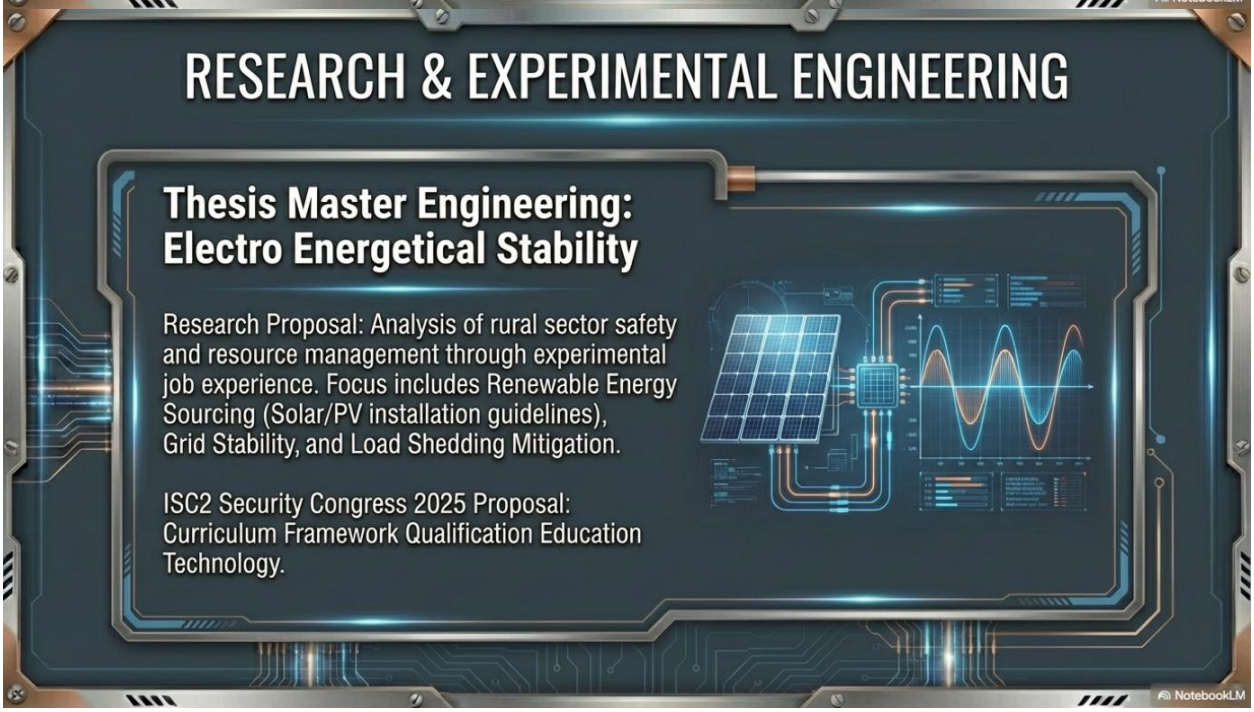
NotebookLM

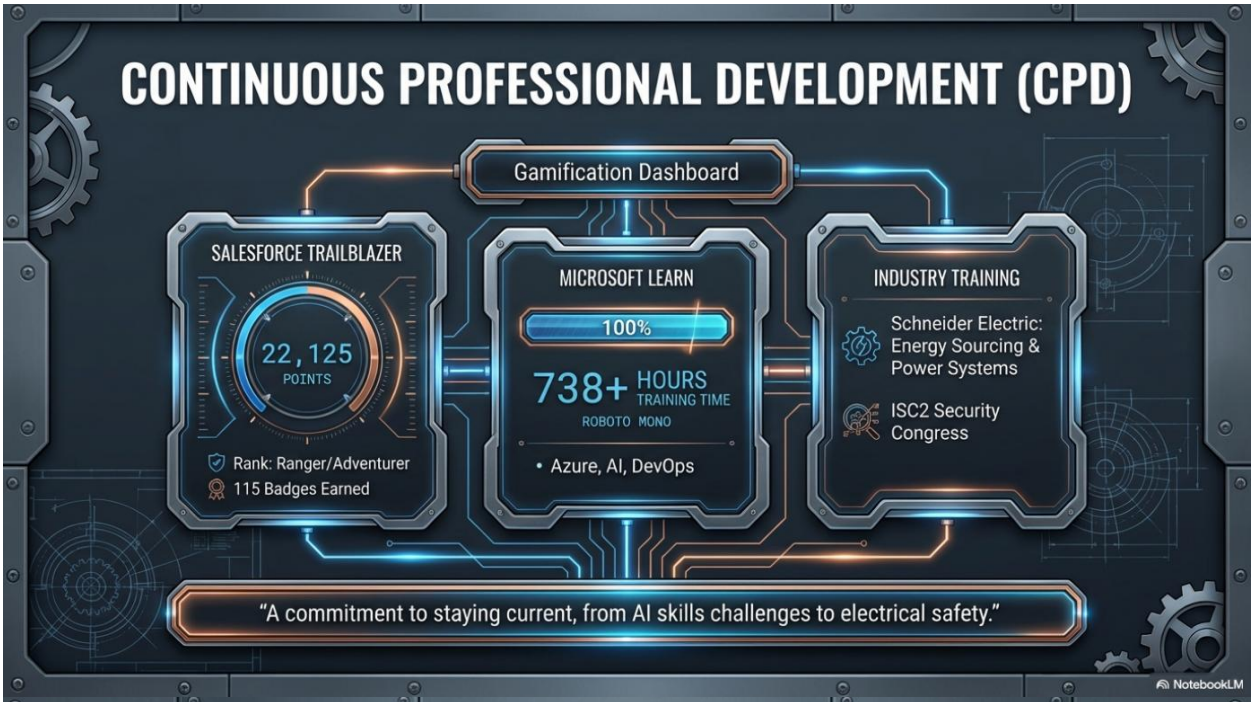

CLOUD INFRASTRUCTURE & CONTAINERIZATION MASTERY
CONTAINERS & DEVOPS
DATA & AI
SECURITY & IDENTITY
Kubernetes (AKS)
Docker
Windows Server
Azure DevOps
CI/CD Pipeline
Azure OpenAI
Generative AI
PyTorch
KQL Analysis
Machine Learning
Microsoft Entra ID
Zero Trust Architecture
Identity Mgmt
CONTAINERS & DEVOPS
DATA & AI
SECURITY & IDENTITY
NotebookLM


FULL-STACK DEVELOPMENT & PROGRAMMING
main.cs
1 var data = new Library();
2 method.Call(data);
script.py
1 import pandas as pd;
2 while loop_active:
3 data_dict.update()
query.kql
1 Table
2 | where TimeGenerated > ago(1h)
3 | summarize count()
REPOSITORY STATS
Tools: Visual Studio Code, GitHub, Azure Cloud Shell
Git Activity: Branching, Merging, Issue Contribution
Repository Source: "run project code data source"
NotebookLM


PHYSICAL SECURITY SYSTEMS & LEGAL COMPLIANCE
HARDWARE EXPERTISE
• Intrusion Detection Systems
• X-ray & Bomb Detection Equipment
• Alarm Logic Gates & Wiring
Applying engineering logic to statutory security mandates.
REGULATORY FRAMEWORKS
PSIRA
ACT 56
• PSIRA Registration
• Section 23(6) Exemption
• Private Security Industry Regulation Act 56 of 2001
• Criminal Procedure Act
AUTOMOTIVE SYSTEMS & THERMODYNAMICS
Technical Data Sheet
1. VW Amarok BiTDI Specs
• Cylinders: 4 (1968cc)
• Bore/Stroke: 81mm x 91.5mm
• Compression Ratio: 16.5:1
2. Performance Calculations
• Head Gasket Volume (HGV) Analysis
• Brake Test: 100-0kph in 2.77 seconds
3. Subaru Powertrain
• Horizontally Opposed 4-Cylinder
• CVT Transmission Ratio Analysis

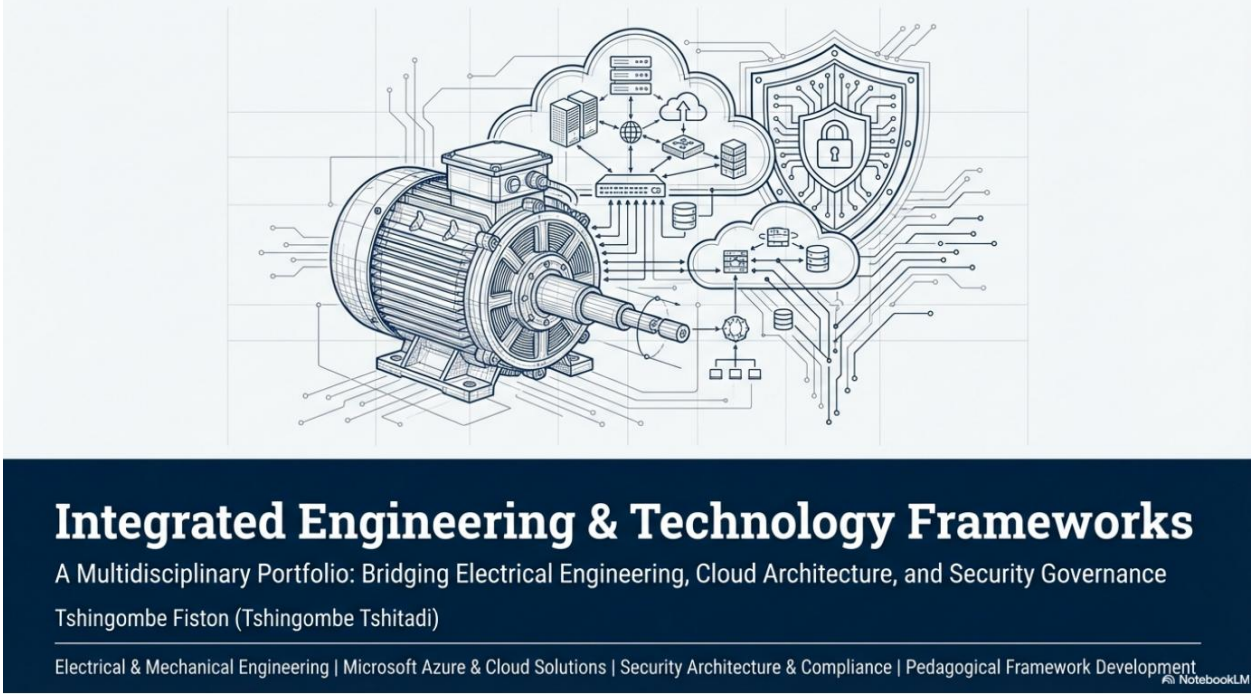

PEDAGOGY, ASSESSMENT & CURRICULUM DEVELOPMENT
INPUT
(Curriculum)
• CAPS, NCV, SAQA Alignment
PROCESS
(Facilitation)
• Pedagogy vs. Andragogy (Adult Learning)
ASSESSMENT
(Standards)
• Validity, Authenticity, Reliability
FEEDBACK
(Quality Assurance)
• Umalusi Monitoring & Review
Facilitator and Assessor for Engineering Studies (N1-N3) and TVET Colleges.
NotebookLM


RESEARCH & EXPERIMENTAL ENGINEERING
Thesis Master Engineering: Electro Energetical Stability
Research Proposal: Analysis of rural sector safety and resource management through experimental job experience. Focus includes Renewable Energy Sourcing (Solar/PV installation guidelines), Grid Stability, and Load Shedding Mitigation.
ISC2 Security Congress 2025 Proposal: Curriculum Framework Qualification Education Technology.
NotebookLM


CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)
Gamification Dashboard
SALESFORCE TRAILBLAZER
22,125
POINTS
Rank: Ranger/Adventurer
115 Badges Earned
MICROSOFT LEARN
100%
738+ HOURS
TRAINING TIME
ROBOTO MONO
• Azure, AI, DevOps
INDUSTRY TRAINING
Schneider Electric: Energy Sourcing & Power Systems
ISC2 Security Congress
"A commitment to staying current, from AI skills challenges to electrical safety."
NotebookLM

ADMINISTRATIVE & BUSINESS OPERATIONS
TENDERING
• Bid clauses
• Price calculations
• Industrial minimum salaries.
SUPPLY CHAIN
• Flow of manufacture
• Lighting tube design process.
PROJECT LIFECYCLE MANAGEMENT
COMPLIANCE
• SABS Enquiries
• Freedom of Information Requests.
FINANCIAL
• Provisional tax liability
• Bulk order processing.
NotebookLM

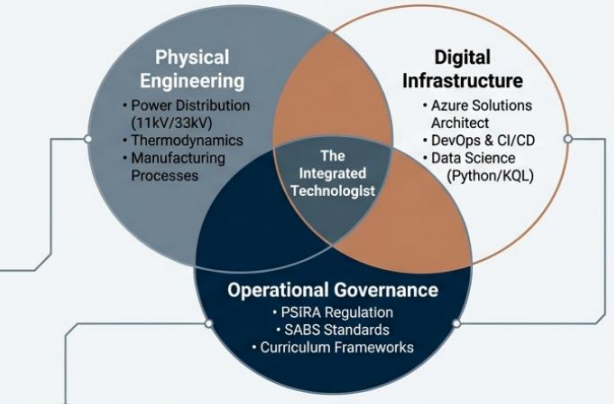
READY FOR DEPLOYMENT
Met Police
(UK)
Microsoft (USA)
Ford (Global)
TARGET ROLES:
- Senior Engineering & Maintenance
- Forensic Analysis & Intelligence Management
- Technical Education & Facilitation
Tshingombe Fiston (Tshitadi)
Johannesburg, Gauteng
Email: tshingombefiston@gmail.com | Phone: 072 529 8946
ENGINEERING INTEGRITY. DIGITAL PROFICIENCY. EDUCATIONAL LEADERSHIP.
NotebookLM


Integrated Engineering & Technology Frameworks
A Multidisciplinary Portfolio: Bridging Electrical Engineering, Cloud Architecture, and Security Governance
Tshingombe Fiston (Tshingombe Tshitadi)
Electrical & Mechanical Engineering | Microsoft Azure & Cloud Solutions | Security Architecture & Compliance | Pedagogical Framework Development
NotebookLM

The Integrated Competency Profile

A comprehensive portfolio demonstrating the convergence of industrial trade theory, advanced digital infrastructure, and regulatory compliance.

Focused on solving systemic backlogs and irregularities in technical education and industrial application through a unique T-shaped skill set.



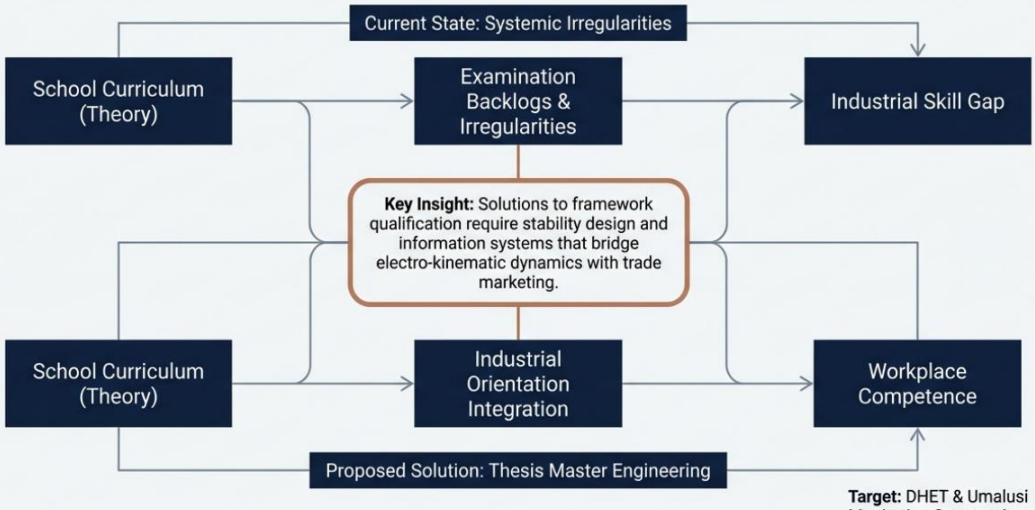
Microsoft Certified: Azure Solutions Architect

NQF Level Monitoring Authority

PSIRA Registered Security Provider

NotebookLM

The Central Thesis: Bridging the Theory-Practice Gap


Current State: Systemic Irregularities
School Curriculum (Theory)
Examination Backlogs & Irregularities
Industrial Skill Gap
Key Insight: Solutions to framework qualification require stability design and information systems that bridge electro-kinematic dynamics with trade marketing.
School Curriculum (Theory)
Industrial Orientation Integration
Workplace Competence
Proposed Solution: Thesis Master Engineering

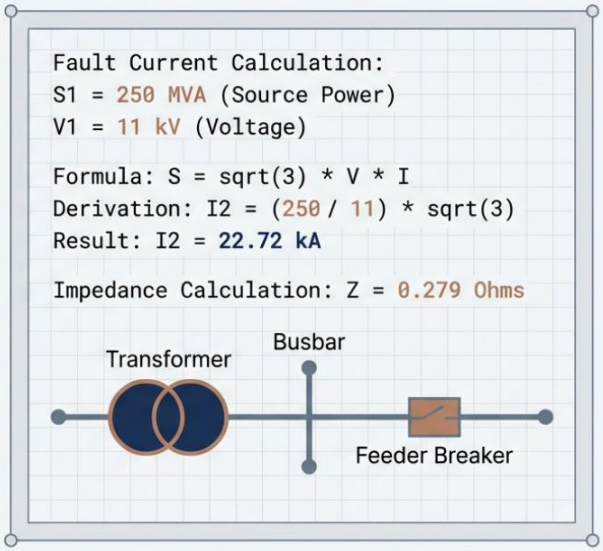
Target: DHET & Umalusi Monitoring Systems improvement.

NotebookLM

Pillar 1: Electrical Engineering & Power Systems

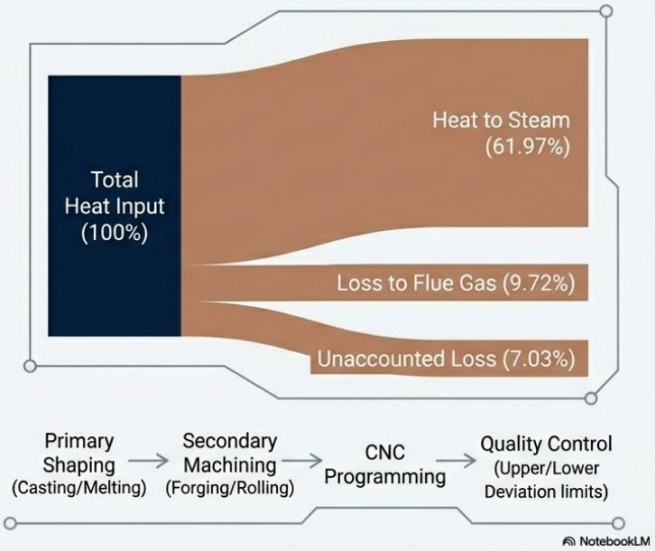
Substation & Fault Analysis

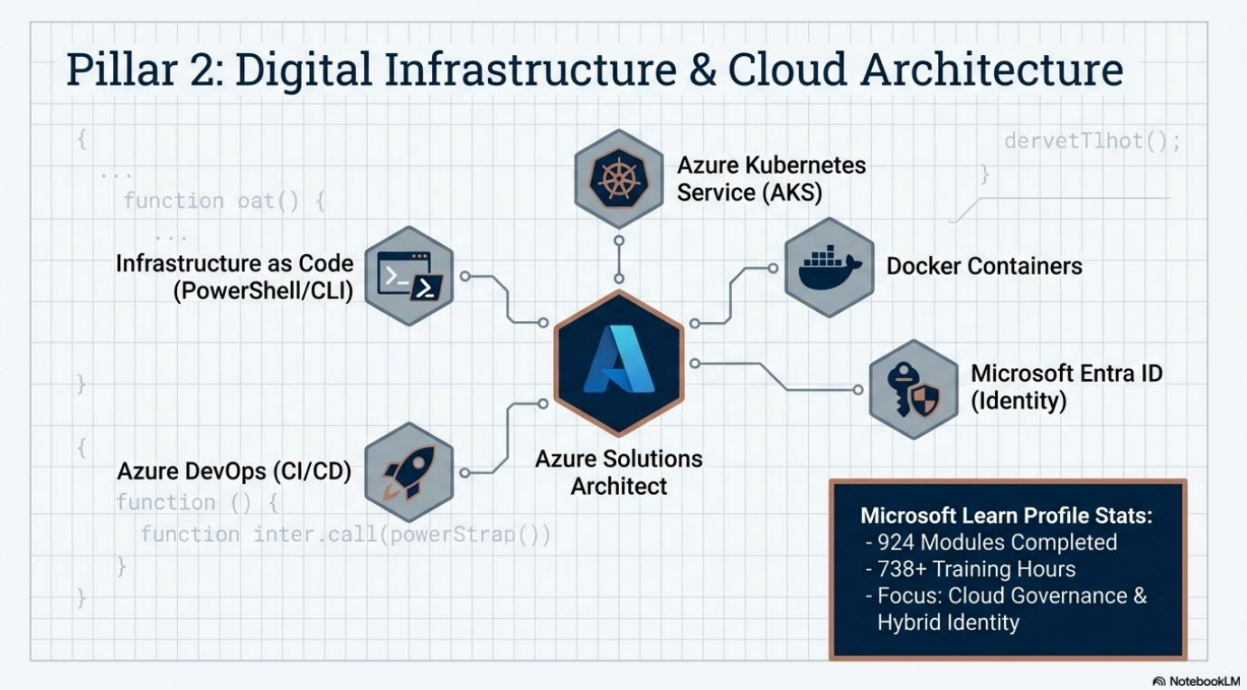
- Substation Design (33kV / 11kV)
- Fault Level Calculation on 11kV Feeders
- PV & Renewable Installation Guidelines
- DC Motor Speed Control (PWM & H-Bridge)

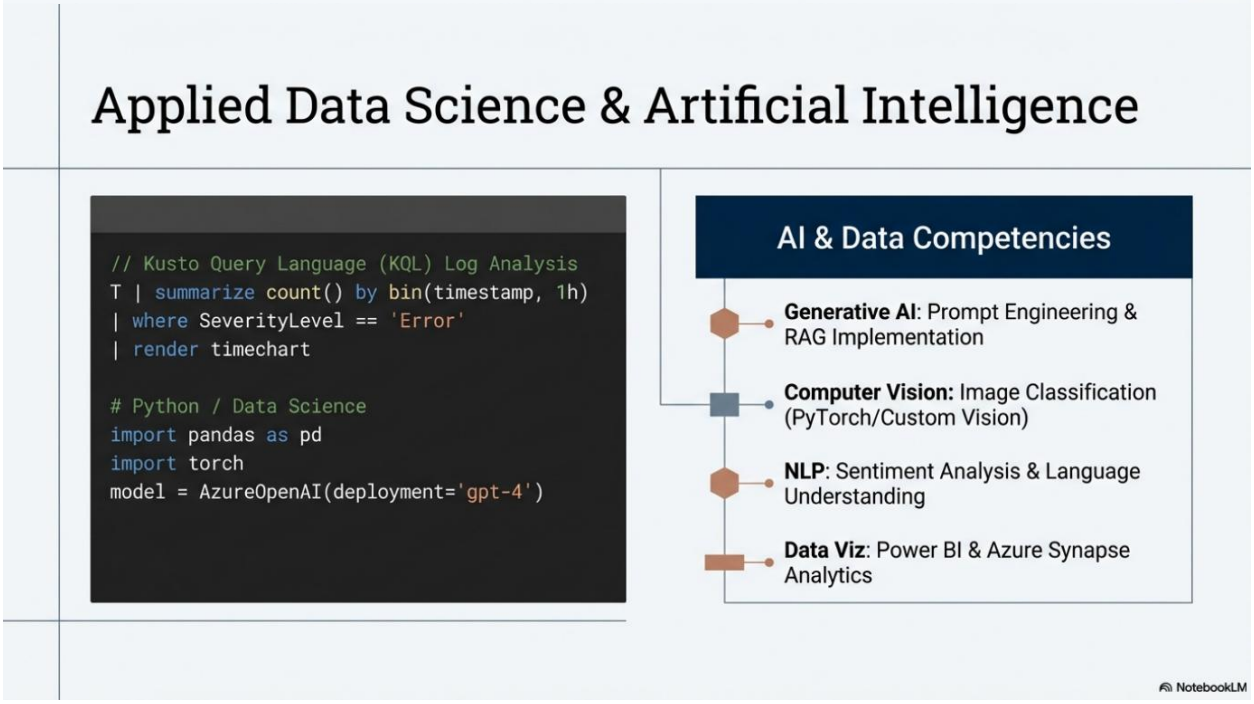

Fault Current Calculation:
S1 = 250 MVA (Source Power)
V1 = 11 kV (Voltage)
Formula: S = sqrt(3) * V * I
Derivation: I2 = (250 / 11) * sqrt(3)
Result: I2 = 22.72 kA
Impedance Calculation: Z = 0.279 Ohms
Transformer
Busbar
Feeder Breaker
NotebookLM

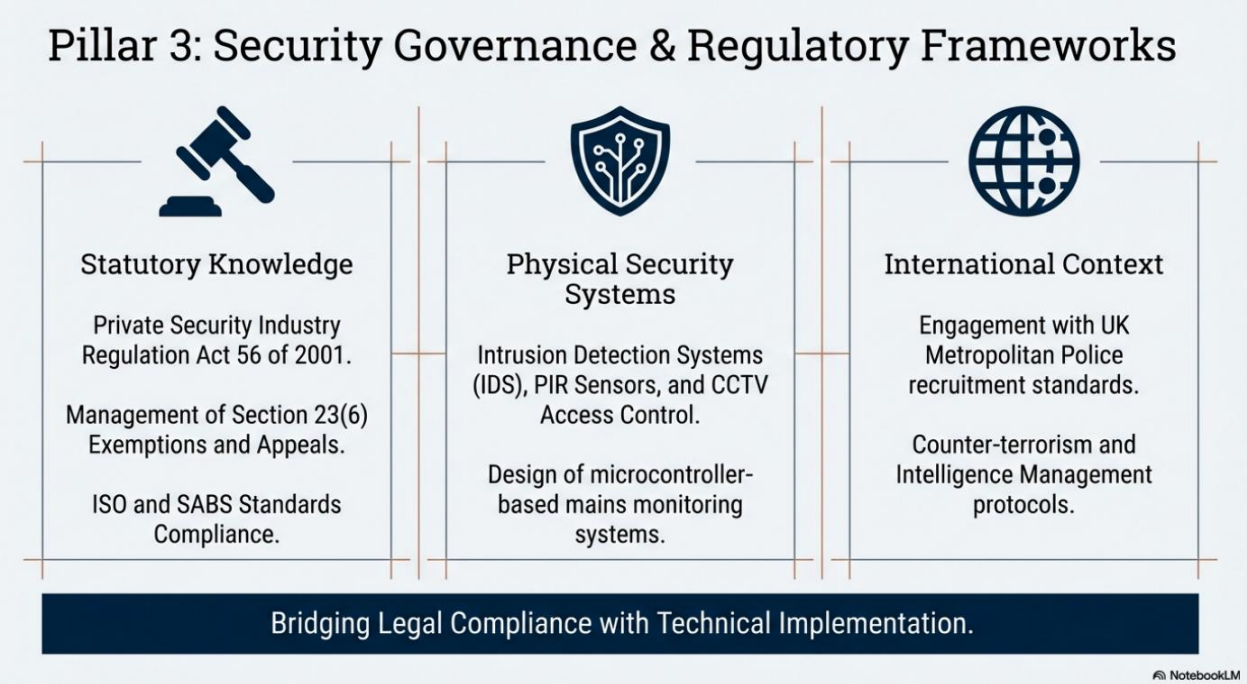
Mechanical Systems & Manufacturing Processes

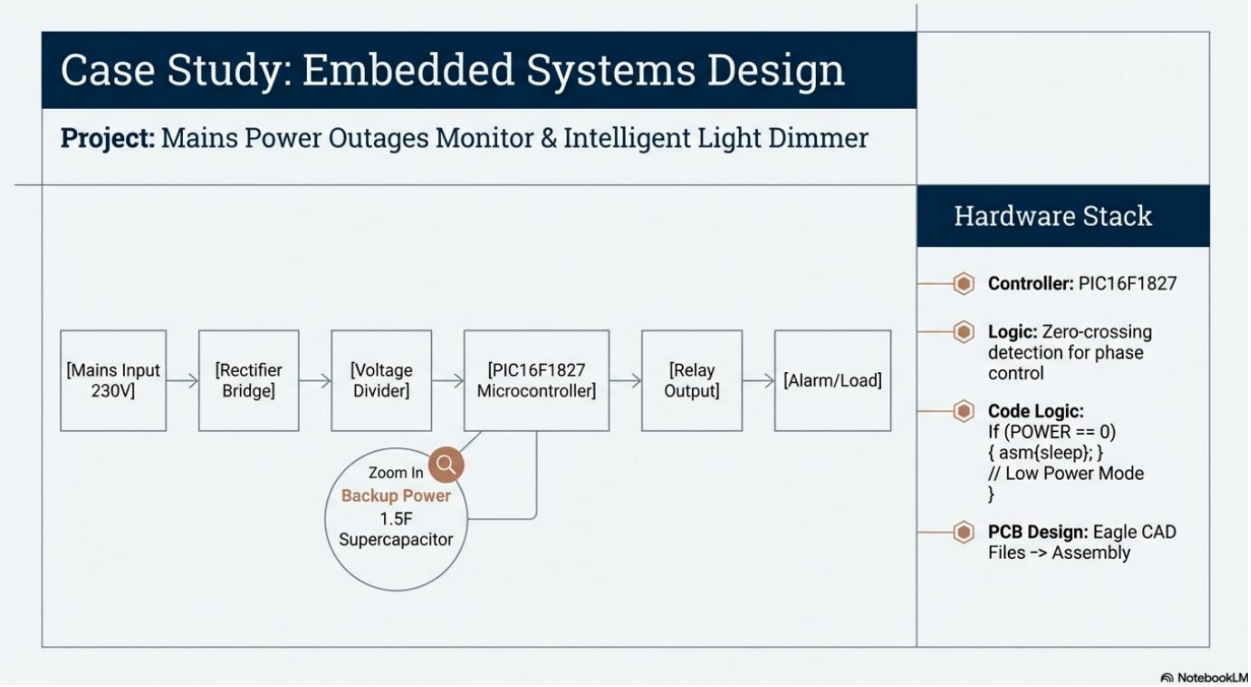
Automotive Performance Specs (VW/Internal Combustion)	
Bore / Stroke	81mm / 91.5mm
Compression Ratio	16.5:1
Max Torque	400nm @ 1500rpm
Thermal Efficiency	(Work Done / Heat Supplied) x 100

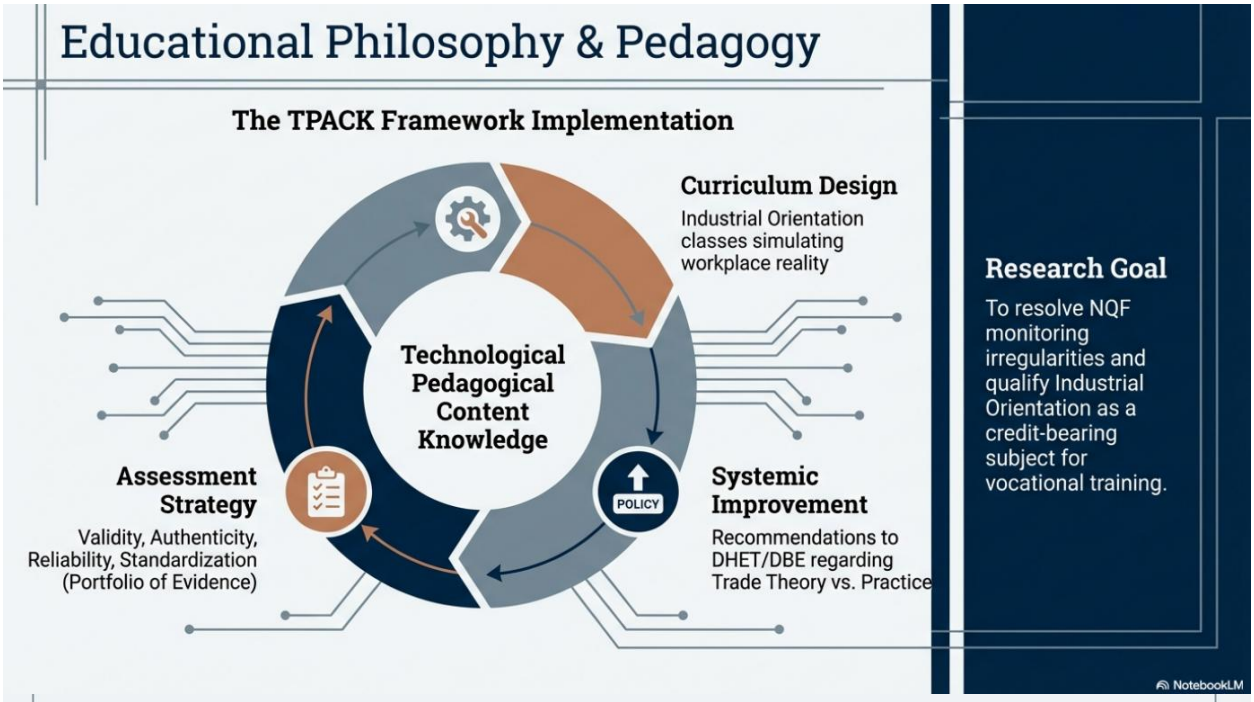


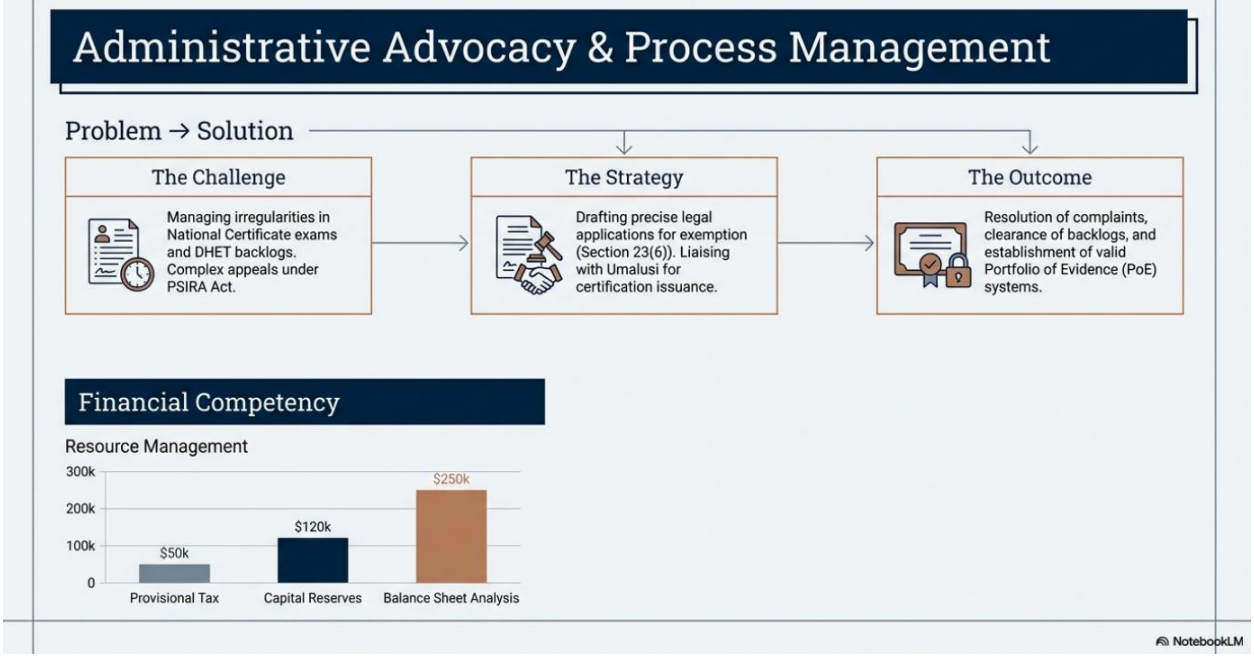

Pillar 2: Digital Infrastructure & Cloud Architecture
Azure Kubernetes Service (AKS)
Infrastructure as Code (PowerShell/CLI)
Docker Containers
Microsoft Entra ID (Identity)
Azure Solutions Architect
Azure DevOps (CI/CD)
Microsoft Learn Profile Stats:
- 924 Modules Completed
- 738+ Training Hours
- Focus: Cloud Governance & Hybrid Identity
NotebookLM


Applied Data Science & Artificial Intelligence
// Kusto Query Language (KQL) Log Analysis
T | summarize count() by bin(timestamp, 1h)
| where SeverityLevel == 'Error'
| render timechart
# Python / Data Science
import pandas as pd
import torch
model = AzureOpenAI(deployment='gpt-4')
AI & Data Competencies
Generative AI: Prompt Engineering & RAG Implementation
Computer Vision: Image Classification (PyTorch/Custom Vision)
NLP: Sentiment Analysis & Language Understanding
Data Viz: Power BI & Azure Synapse Analytics
NotebookLM


Pillar 3: Security Governance & Regulatory Frameworks
Statutory Knowledge
Private Security Industry Regulation Act 56 of 2001.
Management of Section 23(6) Exemptions and Appeals.
ISO and SABS Standards Compliance.
Physical Security Systems
Intrusion Detection Systems (IDS), PIR Sensors, and CCTV Access Control.
Design of microcontroller-based mains monitoring systems.
International Context
Engagement with UK Metropolitan Police recruitment standards.
Counter-terrorism and Intelligence Management protocols.
Bridging Legal Compliance with Technical Implementation.
NotebookLM


Case Study: Embedded Systems Design
Project: Mains Power Outages Monitor & Intelligent Light Dimmer
[Mains Input 230V]
[Rectifier Bridge]
[Voltage Divider]
[PIC16F1827 Microcontroller]
[Relay Output]
[Alarm/Load]
Zoom In
Backup Power
1.5F
Supercapacitor
Hardware Stack
Controller: PIC16F1827
Logic: Zero-crossing detection for phase control
Code Logic:
If (POWER == 0)
{ asm{sleep}; }
// Low Power Mode
}
PCB Design: Eagle CAD Files -> Assembly
NotebookLM


Educational Philosophy & Pedagogy
The TPACK Framework Implementation
Curriculum Design
Industrial Orientation classes simulating workplace reality
Technological Pedagogical Content Knowledge
Assessment Strategy
Validity, Authenticity, Reliability, Standardization (Portfolio of Evidence)
POLICY
Systemic Improvement
Recommendations to DHET/DBE regarding Trade Theory vs. Practice
Research Goal
To resolve NQF monitoring irregularities and qualify Industrial Orientation as a credit-bearing subject for vocational training.
NotebookLM


Administrative Advocacy & Process Management
Problem → Solution
The Challenge
Managing irregularities in National Certificate exams and DHET backlogs. Complex appeals under PSIRA Act.
The Strategy
Drafting precise legal applications for exemption (Section 23(6)). Liaising with Umalusi for certification issuance.
The Outcome
Resolution of complaints, clearance of backlogs, and establishment of valid Portfolio of Evidence (PoE) systems.
Financial Competency
Resource Management
300k
200k
100k
0
$50k
$120k
$250k
Provisional Tax
Capital Reserves
Balance Sheet Analysis
NotebookLM

Applied Research: The 'Experimental' Job Experience

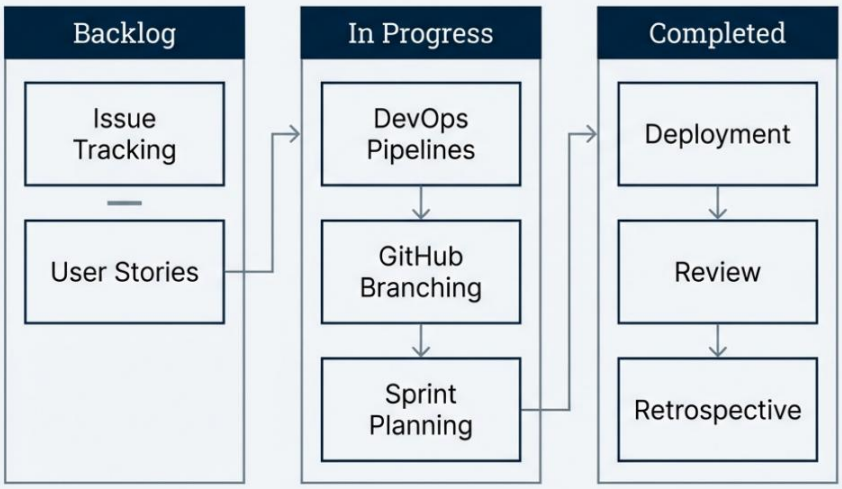
	Academic Input	Industrial Output
1	School Curriculum	Trade Marketing Needs
2	Theoretical Electro-Kinematics	Stability Design & Information Systems
3	Standard Examination	Experimental Workplace Practice

Thesis Proposal: "Thesis Master Engineering"

A framework proposing that stability design and information systems must bridge the gap between electro-kinematic dynamics and trade marketing realities. Advocating for "Industrial Orientation" as a recognized qualification subject.

NotebookLM

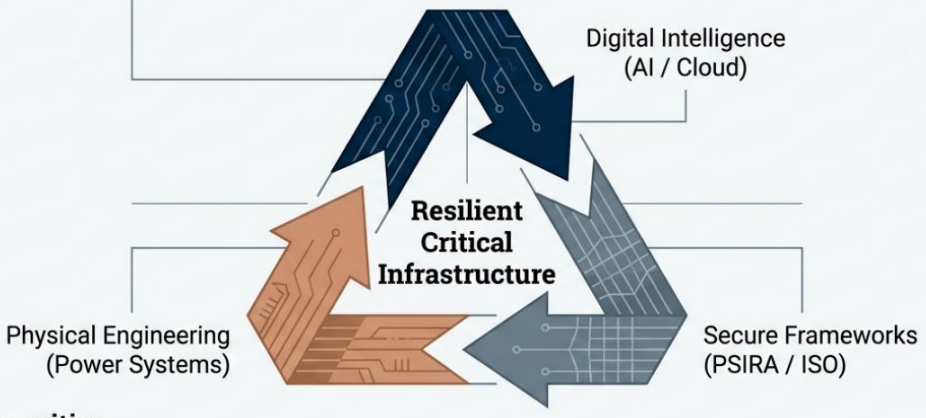
Project Management & Agile Methodologies



Tools & Frameworks:

- Azure DevOps & Azure Boards
- GitHub Actions (CI/CD)
- Scrum / Agile Leadership
- ICT Operations: Plan, Organize, Direct, Control

Future Vision: The Converged Technologist



Value Proposition

Seeking roles in **Engineering Education, Cloud Systems Architecture**, and **Technical Security Management**. Ready to implement the **'Thesis Master Engineering'** framework to modernize technical education and ensure industrial compliance.

NotebookLM

Tshingombe Fiston (Tshitadi)

Innovator in Engineering Education & Secure Infrastructure

Email: tshingombefiston@gmail.com
Phone: +27 72 529 8946
Location: Johannesburg, South Africa

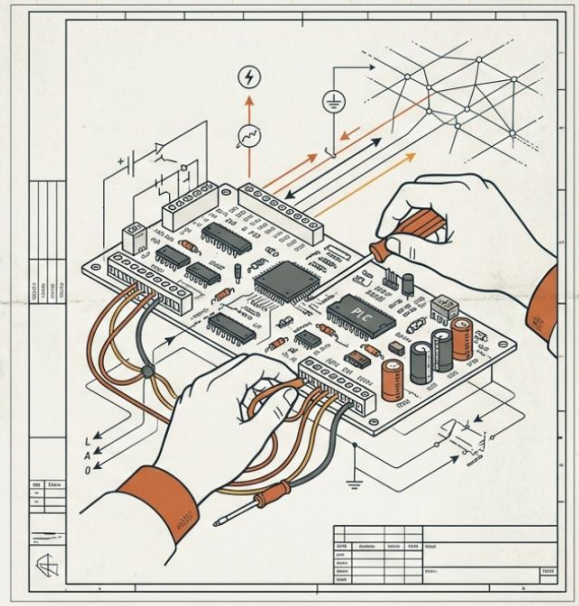
GitHub: github.com/kananga5
Salesforce Trailhead: Ranger Rank (22,125 Points)
Microsoft Learn: 900+ Modules Completed

NotebookLM

Empowering the Grid

An Integrated Framework for Vocational Education & Rural Electrification

Bridging the Gap Between NATED/NCV Qualifications and Industrial Reality in South Africa



PROPOSAL BY TSHINGOMBE TSHITADI | ELECTRICAL ENGINEERING & EDUCATIONAL TECHNOLOGY

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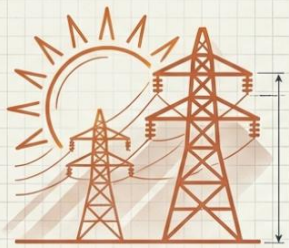
A Multi-Dimensional Intervention Strategy

Solving South Africa's energy crisis requires a re-engineered workforce.

Educational Reform

Harmonizing the disconnect between National Diploma (NATED) theory and National Certificate (NCV) practicals to eliminate certification backlogs.



Technical Innovation

Deploying hybrid off-grid solutions (Solar/Hydro) and AI-driven load management for the 3.4M households in the backlog.

Industry Alignment

Direct operational partnerships with Eskom, City Power, and Schneider Electric to ensure graduates are "work-ready' upon certification.

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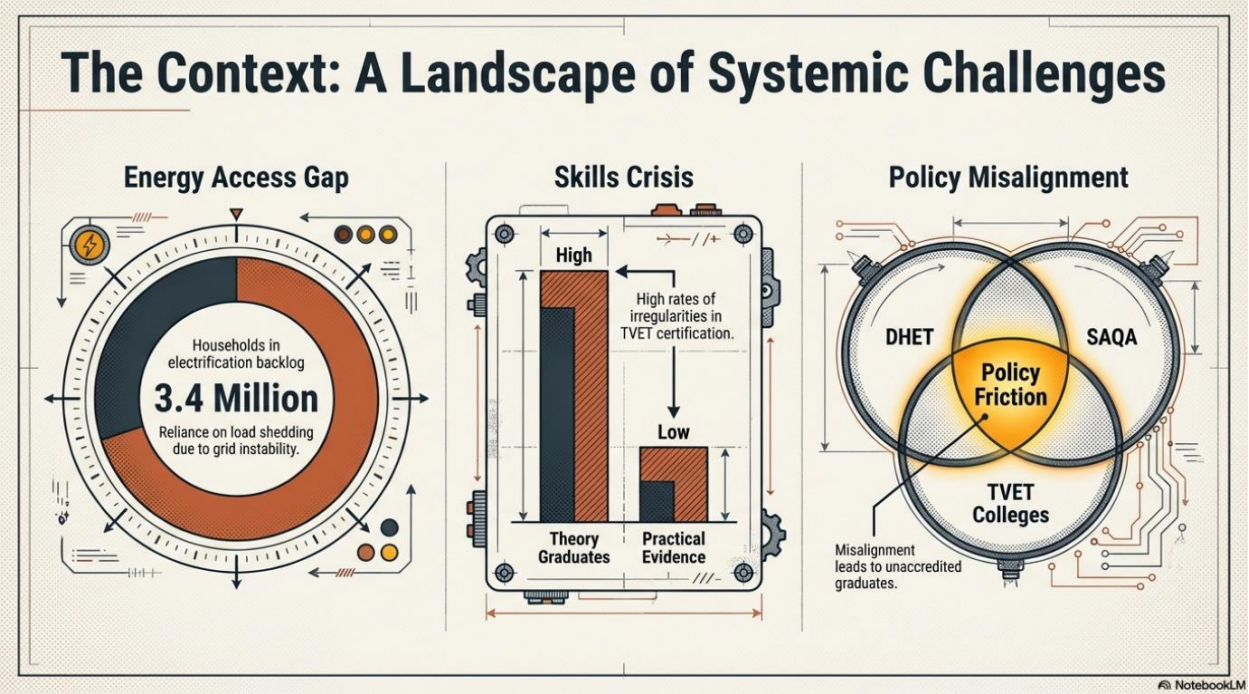
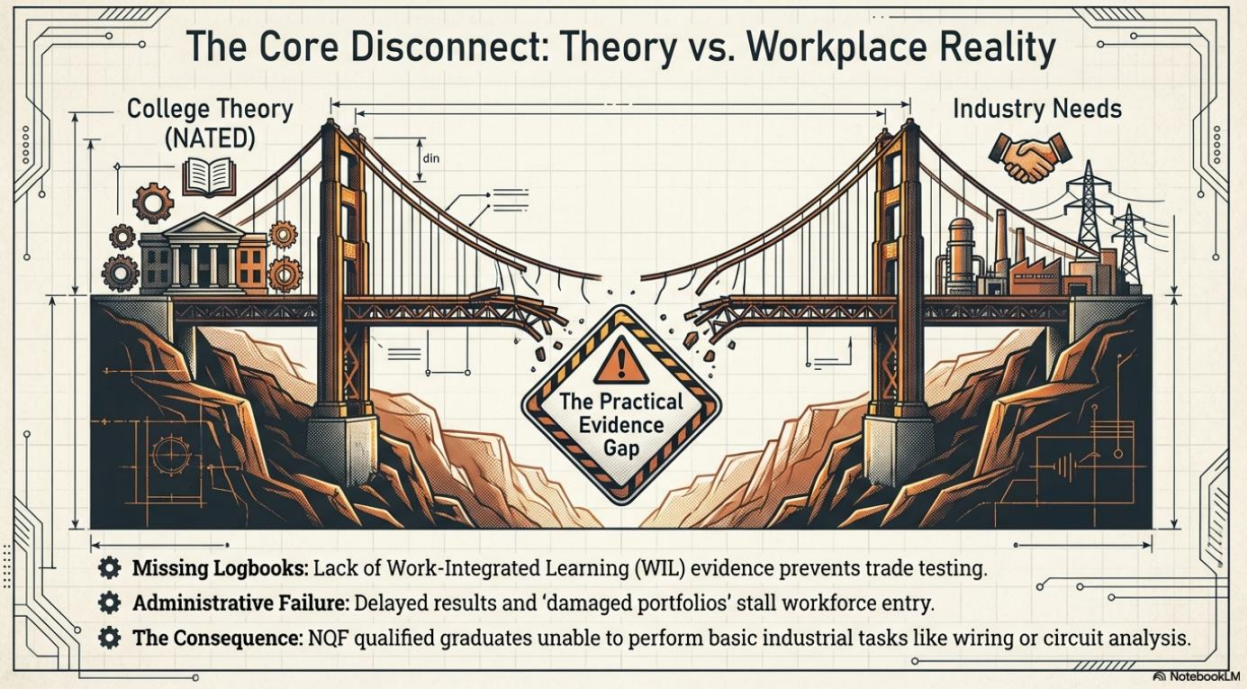
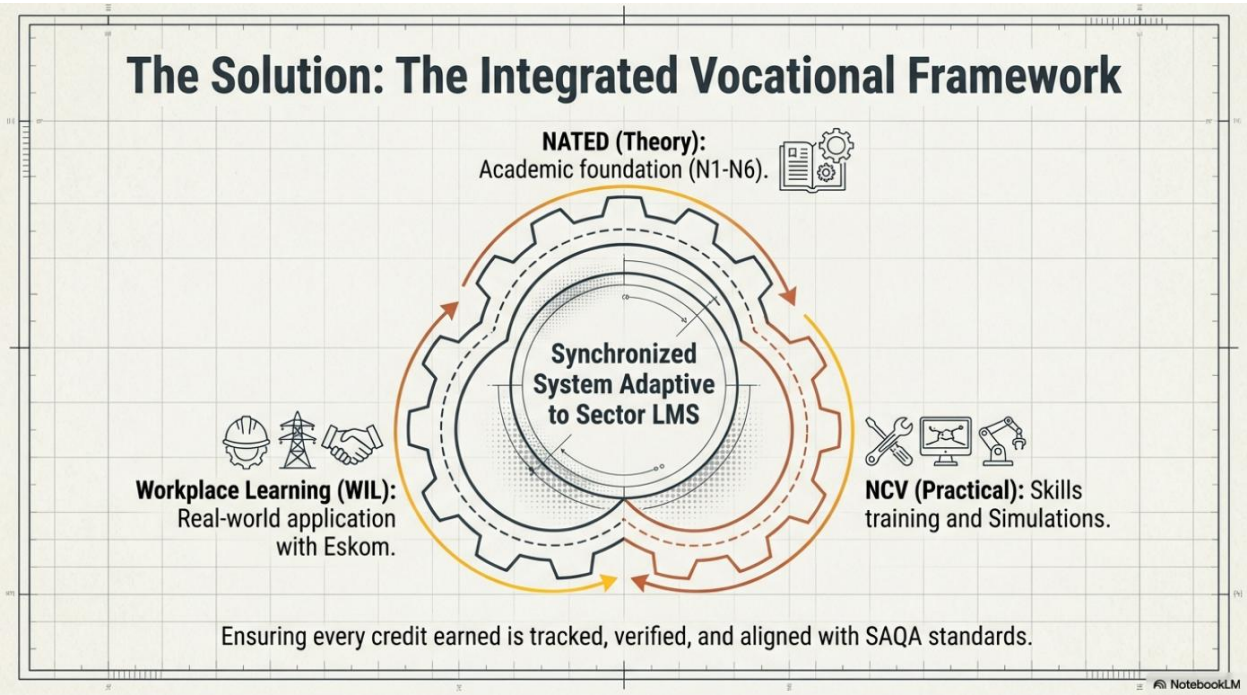
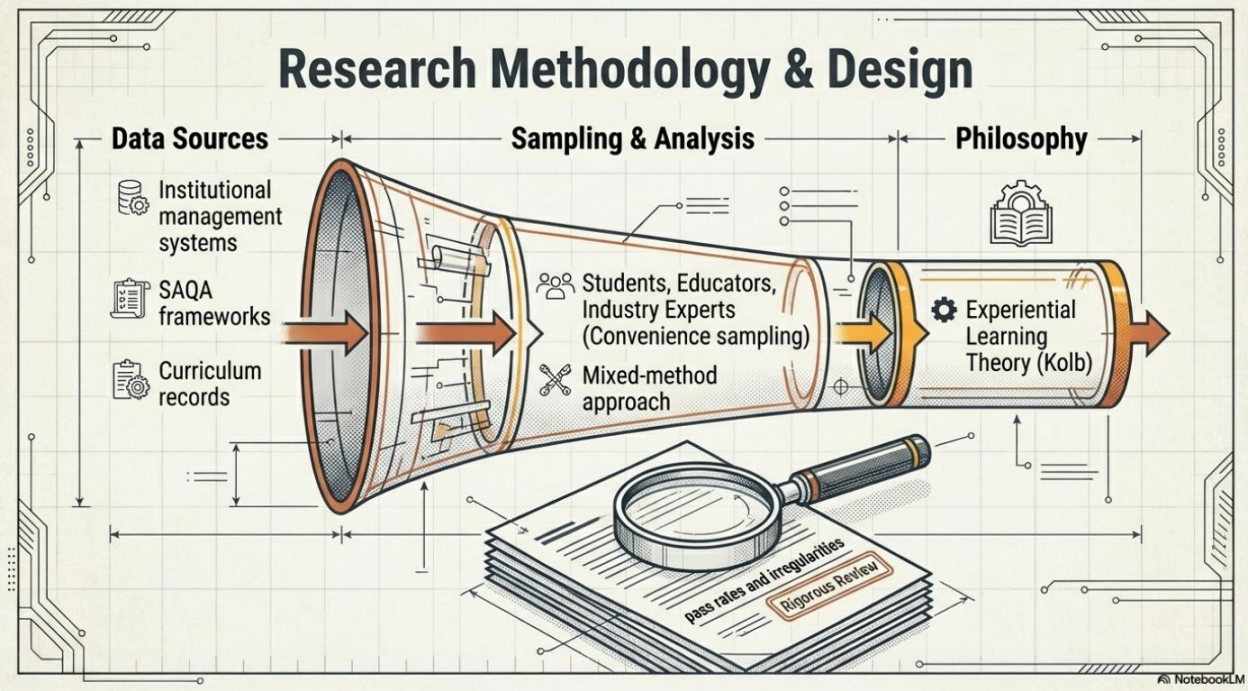
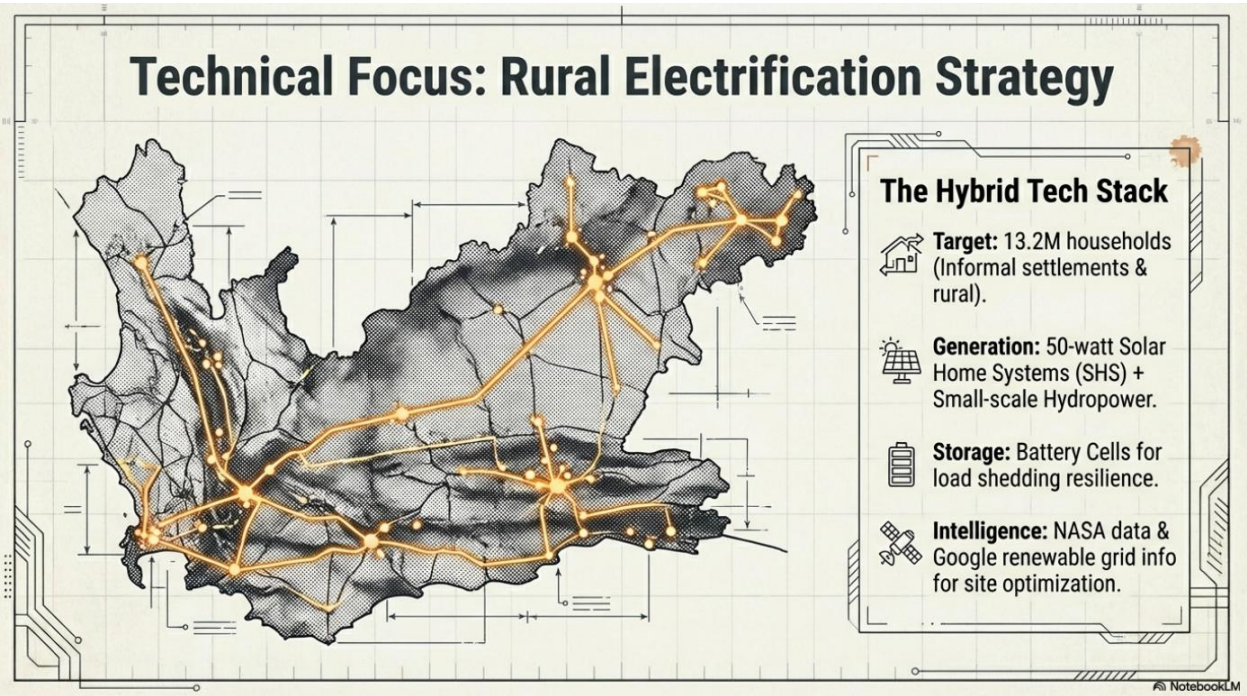
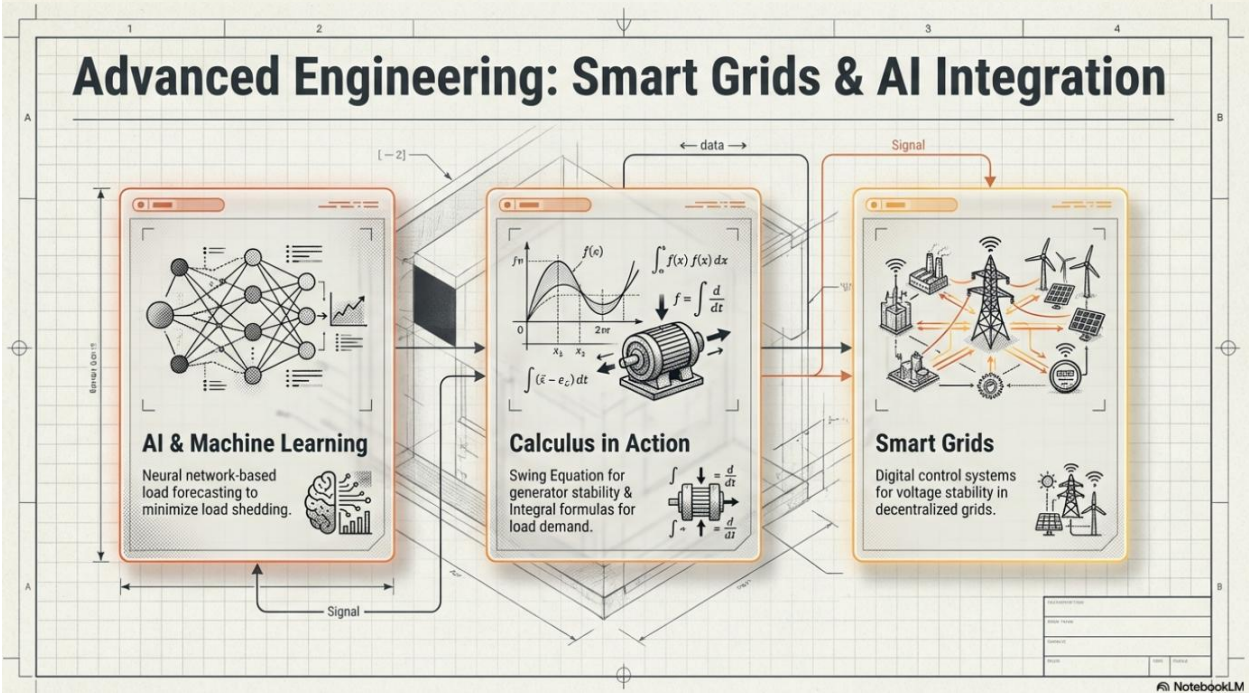

The Context: A Landscape of Systemic Challenges
Energy Access Gap
Households in electrification backlog
3.4 Million
Reliance on load shedding due to grid instability.
Skills Crisis
High
Low
High rates of irregularities in TVET certification.
Theory Graduates
Practical Evidence
Policy Misalignment
DHET
SAQA
Policy Friction
TVET Colleges
Misalignment leads to unaccredited graduates.
NotebookLM

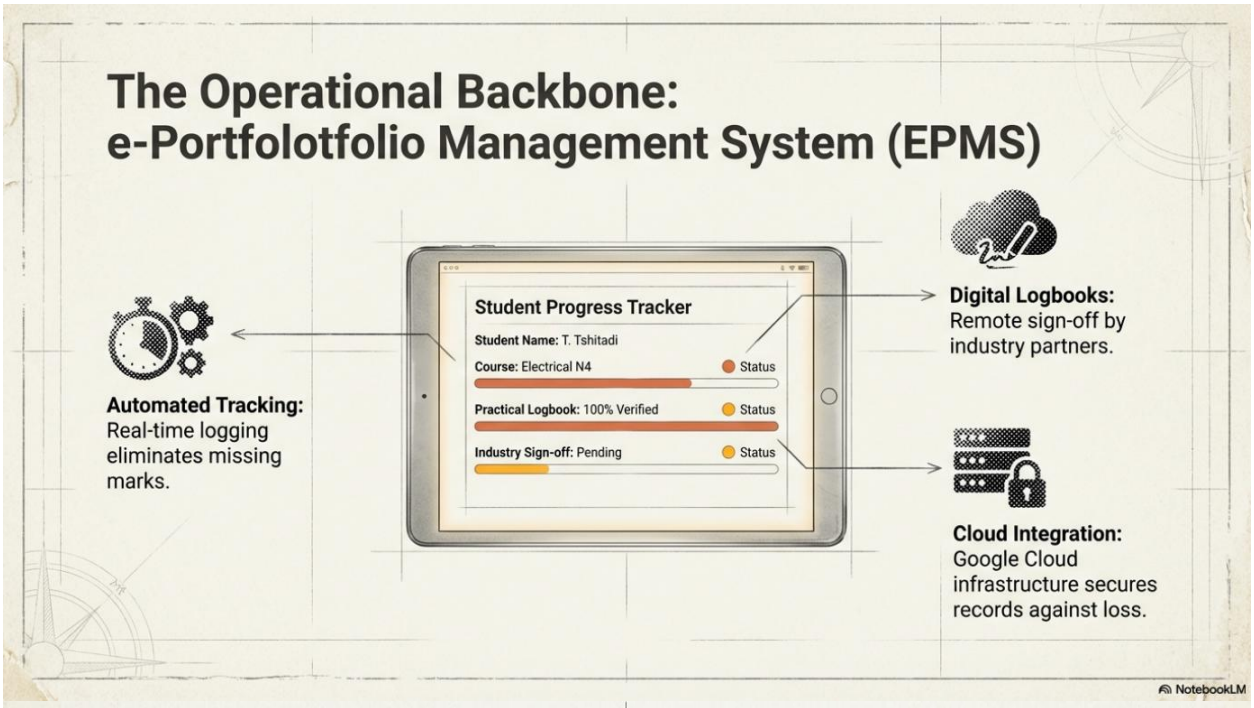

The Core Disconnect: Theory vs. Workplace Reality
College Theory (NATED)
Industry Needs
The Practical Evidence Gap
Missing Logbooks: Lack of Work-Integrated Learning (WIL) evidence prevents trade testing.
Administrative Failure: Delayed results and 'damaged portfolios' stall workforce entry.
The Consequence: NQF qualified graduates unable to perform basic industrial tasks like wiring or circuit analysis.
NotebookLM

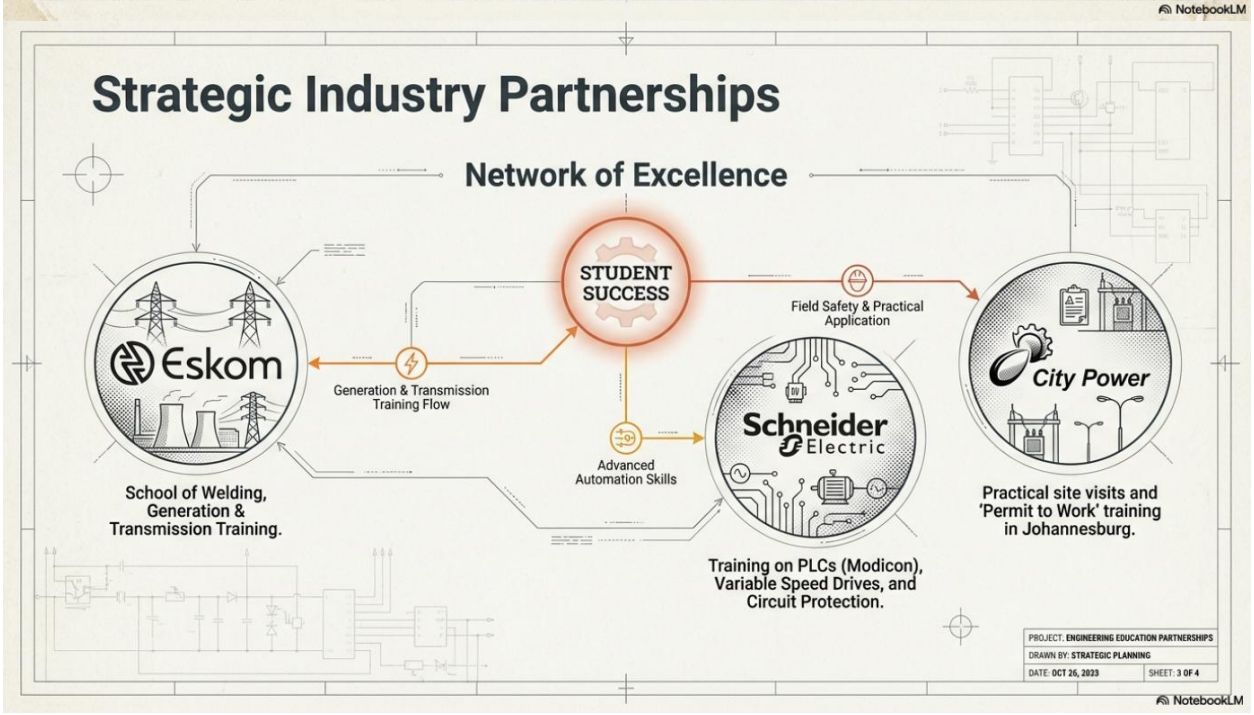

The Solution: The Integrated Vocational Framework
NATED (Theory):
Academic foundation (N1-N6).
Synchronized System Adaptive to Sector LMS
Workplace Learning (WIL):
Real-world application with Eskom.
NCV (Practical): Skills training and Simulations.
Ensuring every credit earned is tracked, verified, and aligned with SAQA standards.
NotebookLM


Research Methodology & Design
Data Sources
Sampling & Analysis
Philosophy
Institutional management systems
SAQA frameworks
Curriculum records
Students, Educators, Industry Experts (Convenience sampling)
Mixed-method approach
Experiential Learning Theory (Kolb)
pass rates and irregularities
Rigorous Review
NotebookLM


Technical Focus: Rural Electrification Strategy
The Hybrid Tech Stack
Target: 13.2M households (Informal settlements & rural).
Generation: 50-watt Solar Home Systems (SHS) + Small-scale Hydropower.
Storage: Battery Cells for load shedding resilience.
Intelligence: NASA data & Google renewable grid info for site optimization.
NotebookLM


Advanced Engineering: Smart Grids & AI Integration
data
Signal
AI & Machine Learning
Neural network-based load forecasting to minimize load shedding.
Calculus in Action
Swing Equation for generator stability & Integral formulas for load demand.
Smart Grids
Digital control systems for voltage stability in decentralized grids.
Signal
NotebookLM


The Operational Backbone:
e-Portfolotfolio Management System (EPMS)
Student Progress Tracker
Student Name: T. Tshitadi
Course: Electrical N4
Status
Practical Logbook: 100% Verified
Status
Industry Sign-off: Pending
Status
Automated Tracking:
Real-time logging eliminates missing marks.
Digital Logbooks:
Remote sign-off by industry partners.
Cloud Integration:
Google Cloud infrastructure secures records against loss.
NotebookLM


Strategic Industry Partnerships
Network of Excellence
STUDENT SUCCESS
Eskom
School of Welding, Generation & Transmission Training.
Generation & Transmission Training Flow
Advanced Automation Skills
Schneider Electric
Training on PLCs (Modicon), Variable Speed Drives, and Circuit Protection.
Field Safety & Practical Application
City Power
Practical site visits and 'Permit to Work' training in Johannesburg.
PROJECT: ENGINEERING EDUCATION PARTNERSHIPS
DRAWN BY: STRATEGIC PLANNING
DATE: OCT 26, 2023
SHEET: 3 OF 4
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Policy Compliance & Quality Assurance
DHET & SAQA Alignment:
Strict adherence to National Qualifications Framework (NQF).
Irregularity Management:
Structured process for backlog insurance and dispute resolution.
Foreign Qualifications:
Dedicated evaluation pathway for non-SA records.
"Goal: Ensuring every graduate has a valid, recognized, and industry-ready certification."
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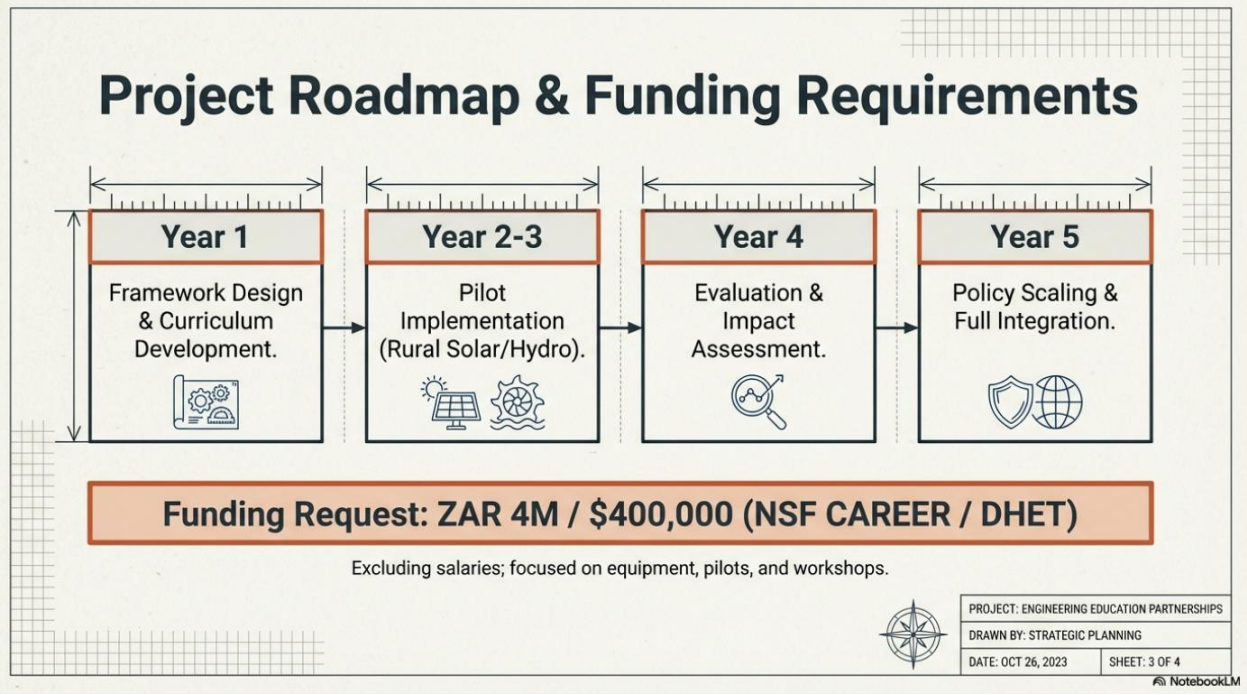
Project Roadmap & Funding Requirements
Year 1
Framework Design & Curriculum Development.
Year 2-3
Pilot Implementation (Rural Solar/Hydro).
Year 4
Evaluation & Impact Assessment.
Year 5
Policy Scaling & Full Integration.
Funding Request: ZAR 4M / $400,000 (NSF CAREER / DHET)
Excluding salaries; focused on equipment, pilots, and workshops.
PROJECT: ENGINEERING EDUCATION PARTNERSHIPS
DRAWN BY: STRATEGIC PLANNING
DATE: OCT 26, 2023
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Socio-Economic Value & Impact

Job creation through a skilled Artisan workforce & reduced load shedding loss.

Bridging the digital divide; access to information via reliable power.

Improved safety via regulated wiring and clean renewable energy.

PROJECT: ENGINEERING EDUCATION PARTNERSHIPS	
DRAWN BY: STRATEGIC PLANNING	
DATE: OCT 26, 2023	SHEET: 4 OF 4

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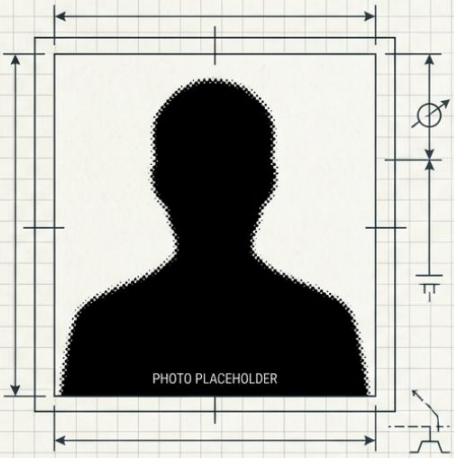
Principal Investigator Profile



Tshingombe Tshitadi

Credentials

- Master's/Engineering background in Electrical Systems.
- Schneider Electric Certifications (PLCs, Variable Speed Drives).
- Expertise in NQF/NATED/NCV Frameworks & ISO Compliance.
- Professional skills in Circuit Analysis and Educational Technology.

PROJECT: ENGINEERING EDUCATION PARTNERSHIPS	
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DATE: OCT 26, 2023	SHEET: 5 OF 5

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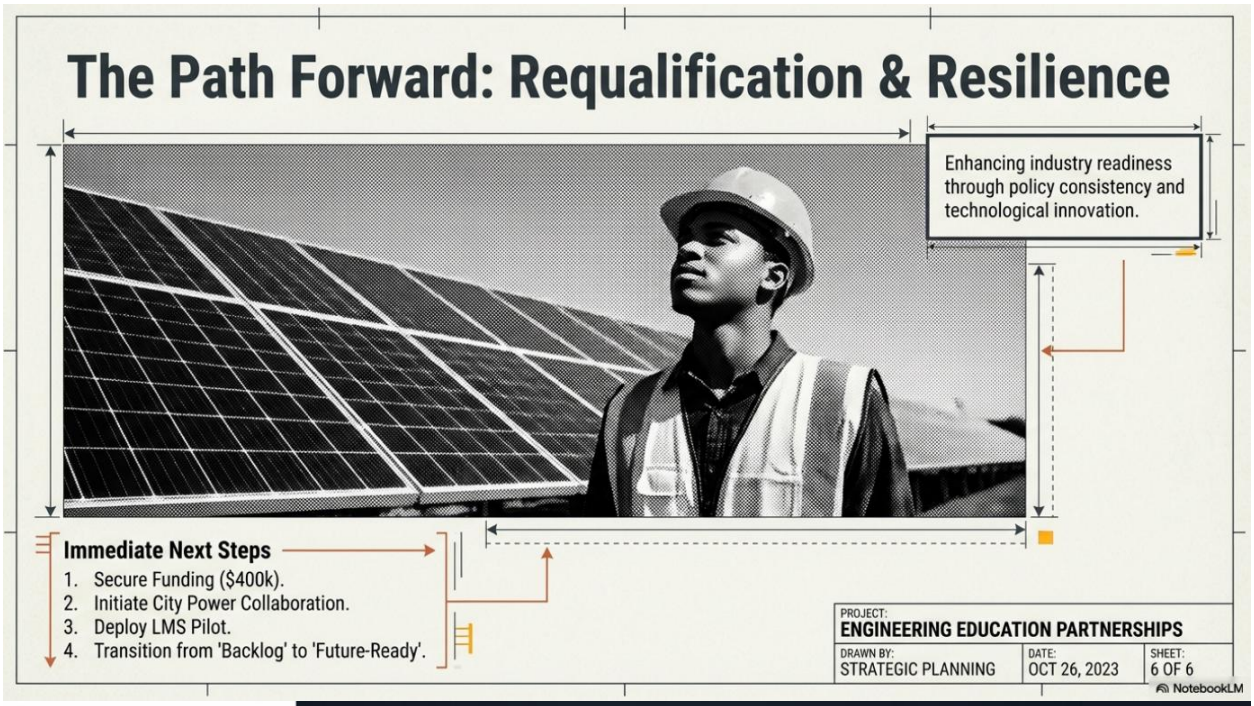
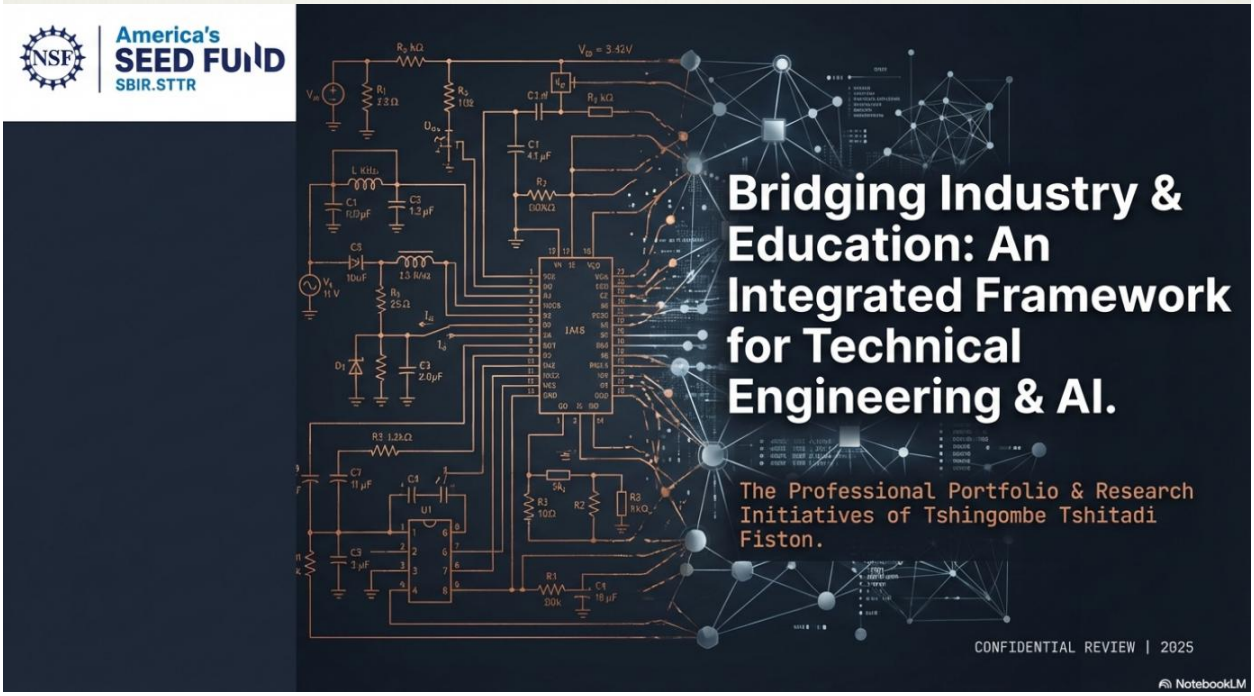
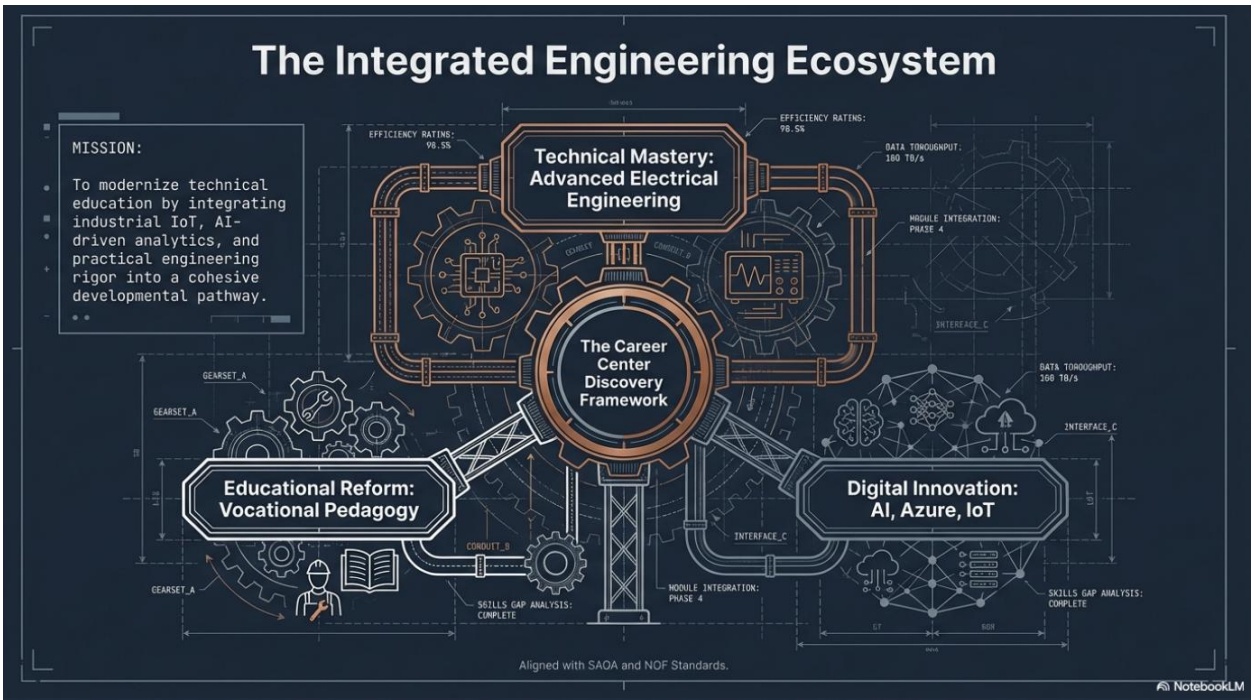

The Path Forward: Requalification & Resilience
Enhancing industry readiness through policy consistency and technological innovation.
Immediate Next Steps
1. Secure Funding ($400k).
2. Initiate City Power Collaboration.
3. Deploy LMS Pilot.
4. Transition from 'Backlog' to 'Future-Ready'.
PROJECT:
ENGINEERING EDUCATION PARTNERSHIPS
DRAWN BY:
STRATEGIC PLANNING
DATE:
OCT 26, 2023
SHEET:
6 OF 6
NotebookLM


America's
SEED FUND
SBIR.STTR
Bridging Industry & Education: An Integrated Framework for Technical Engineering & AI.
The Professional Portfolio & Research Initiatives of Tshingombe Tshitadi Fiston.
CONFIDENTIAL REVIEW | 2025
NotebookLM


The Integrated Engineering Ecosystem
MISSION:
To modernize technical education by integrating industrial IoT, AI-driven analytics, and practical engineering rigor into a cohesive developmental pathway.
Technical Mastery: Advanced Electrical Engineering
The Career Center Discovery Framework
Educational Reform: Vocational Pedagogy
Digital Innovation: AI, Azure, IoT
Aligned with SAQA and NQF Standards.
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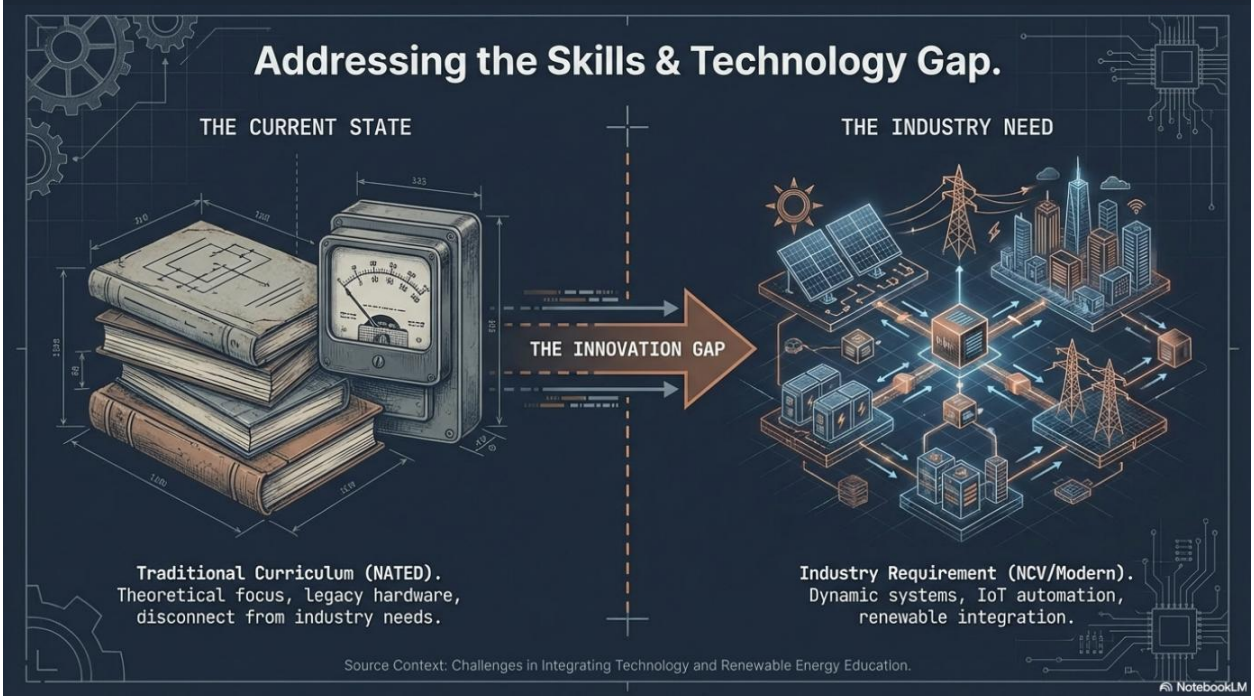
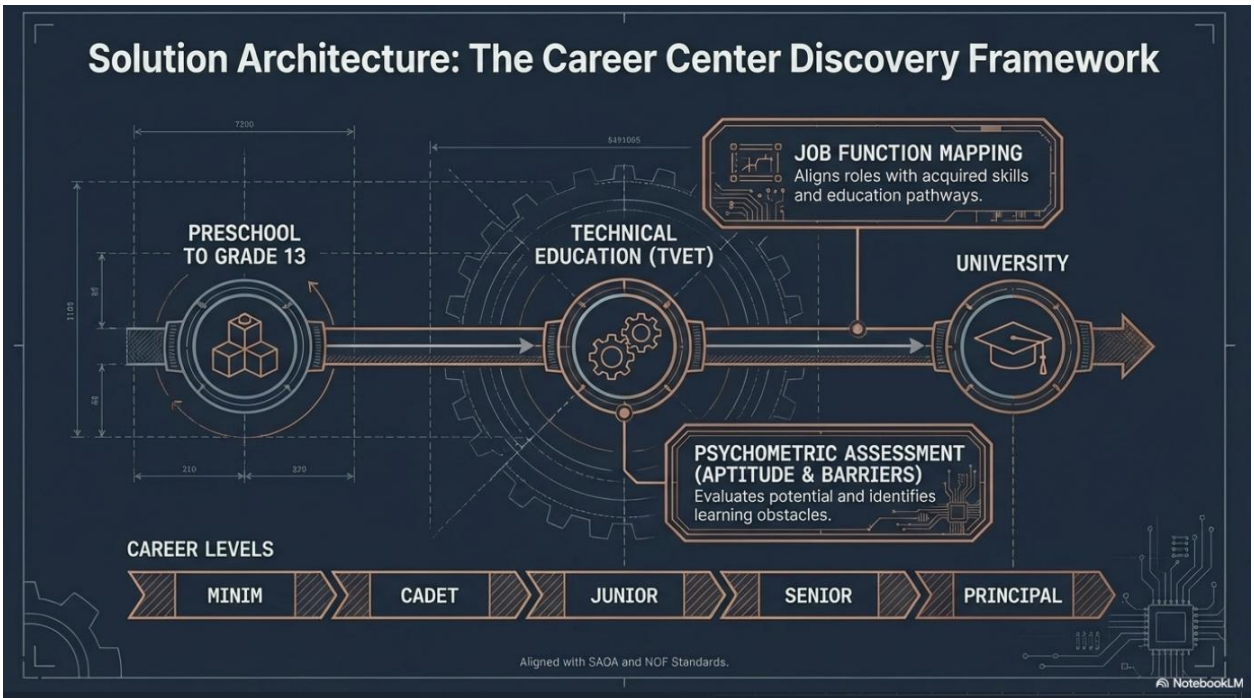
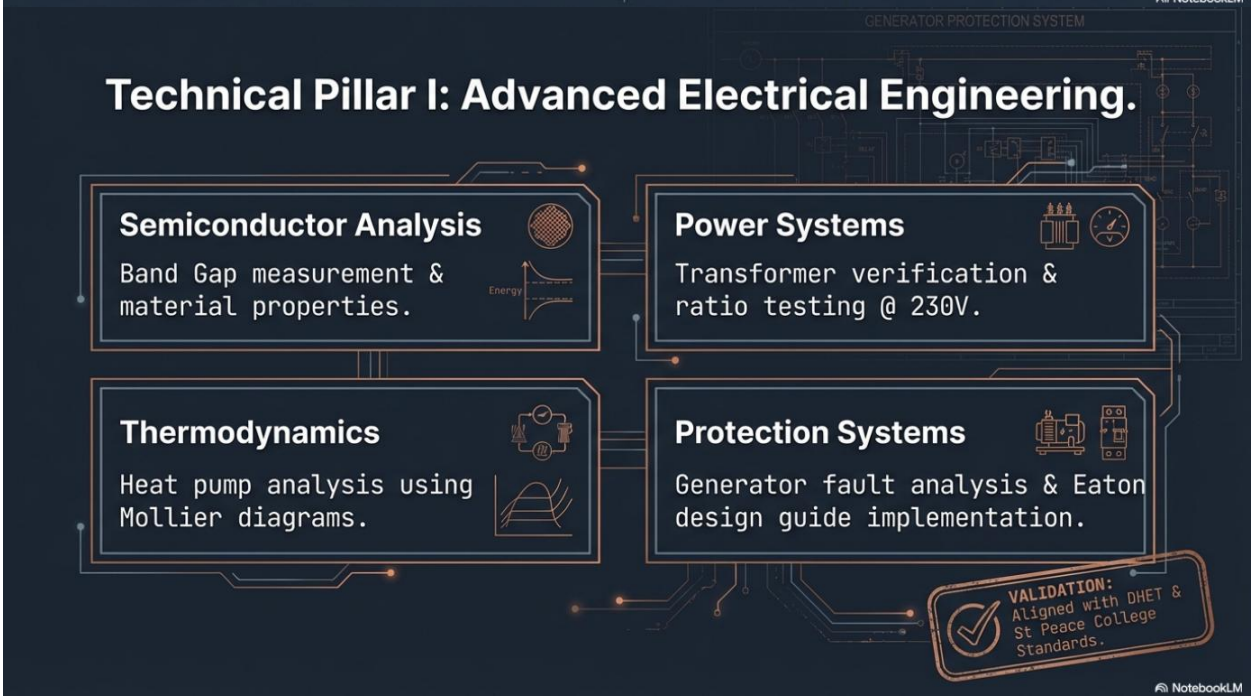

Addressing the Skills & Technology Gap.
THE CURRENT STATE
THE INDUSTRY NEED
THE INNOVATION GAP
Traditional Curriculum (NATED).
Theoretical focus, legacy hardware, disconnect from industry needs.
Industry Requirement (NCV/Modern).
Dynamic systems, IoT automation, renewable integration.
Source Context: Challenges in Integrating Technology and Renewable Energy Education.
NotebookLM


Solution Architecture: The Career Center Discovery Framework
JOB FUNCTION MAPPING
Aligns roles with acquired skills and education pathways.
PRESCHOOL TO GRADE 13
TECHNICAL EDUCATION (TVET)
UNIVERSITY
PSYCHOMETRIC ASSESSMENT (APTITUDE & BARRIERS)
Evaluates potential and identifies learning obstacles.
CAREER LEVELS
MINIM
CADET
JUNIOR
SENIOR
PRINCIPAL
Aligned with SAQA and NQF Standards.
NotebookLM


Technical Pillar I: Advanced Electrical Engineering.
Semiconductor Analysis
Band Gap measurement & material properties.
Energy
Power Systems
Transformer verification & ratio testing @ 230V.
Thermodynamics
Heat pump analysis using Mollier diagrams.
Protection Systems
Generator fault analysis & Eaton design guide implementation.
VALIDATION:
Aligned with DHET & St Peace College Standards.
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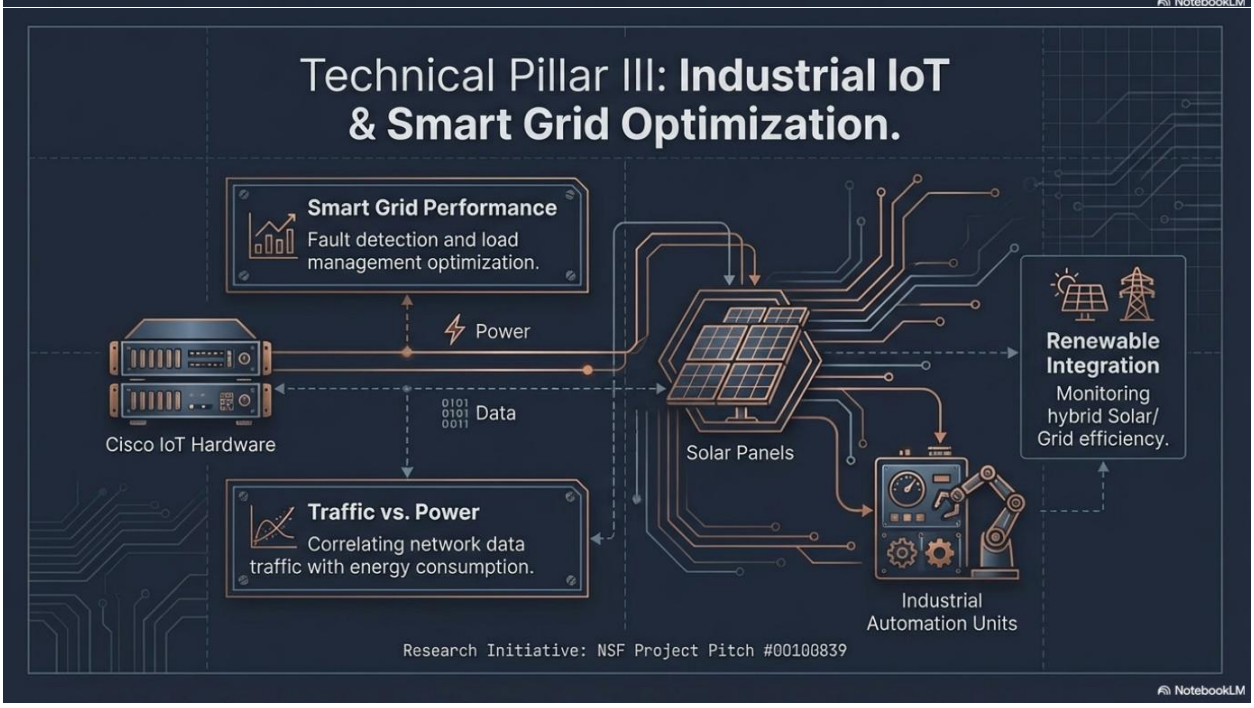
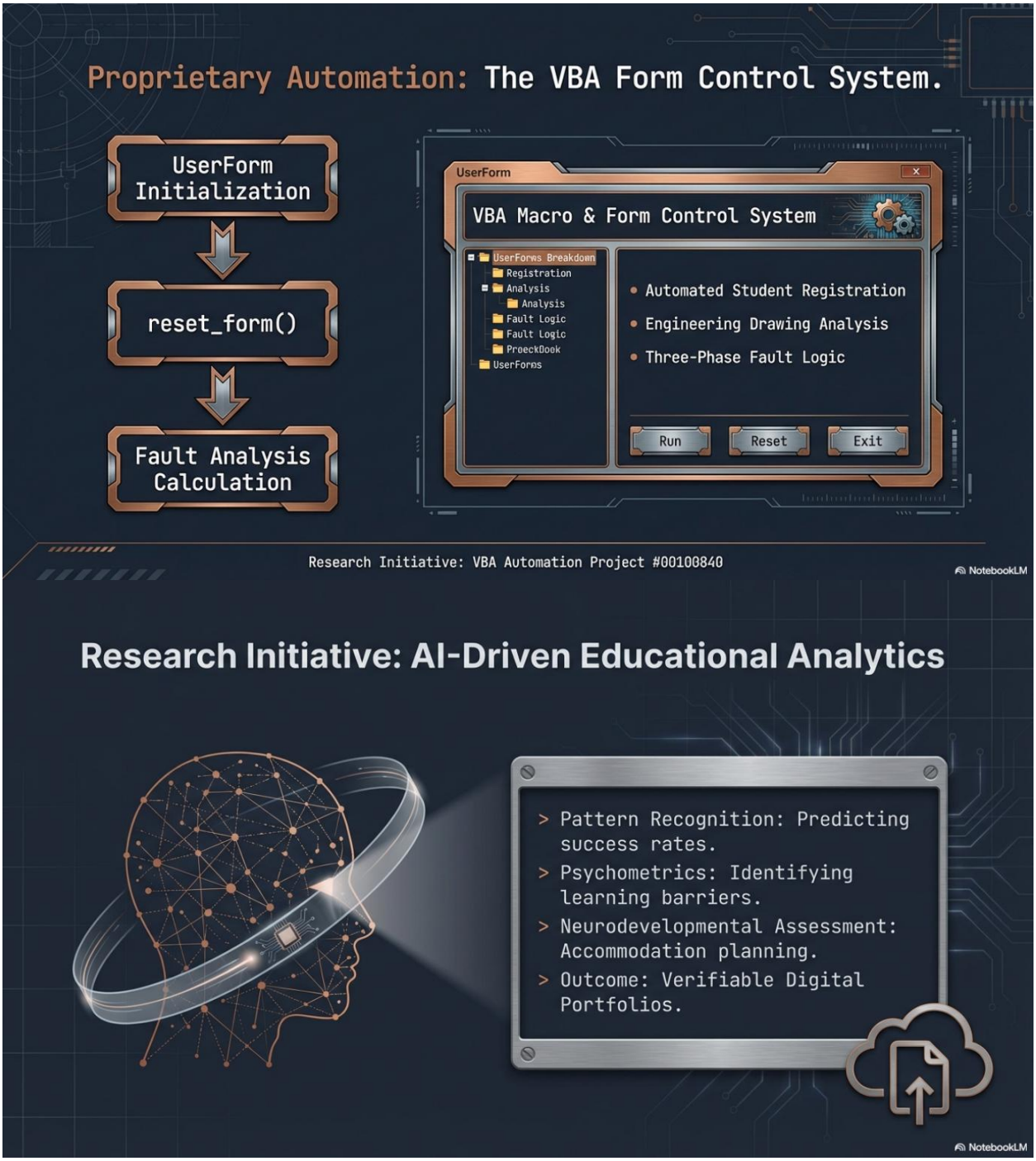
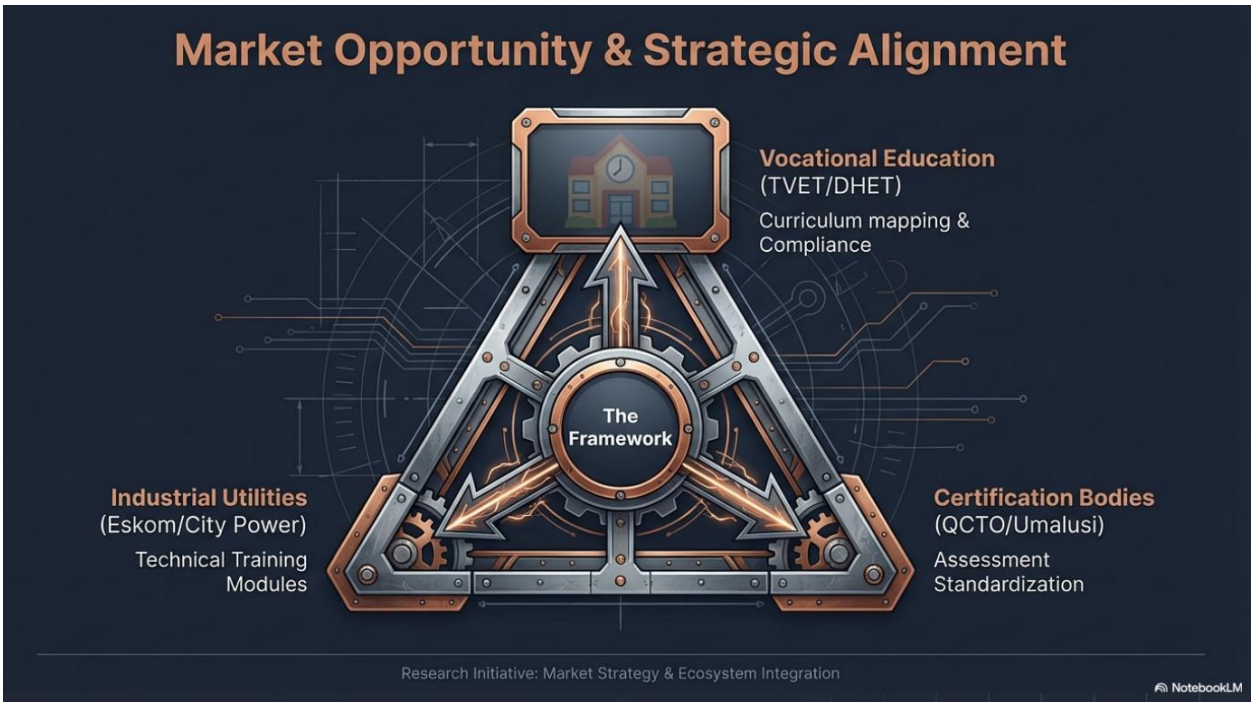
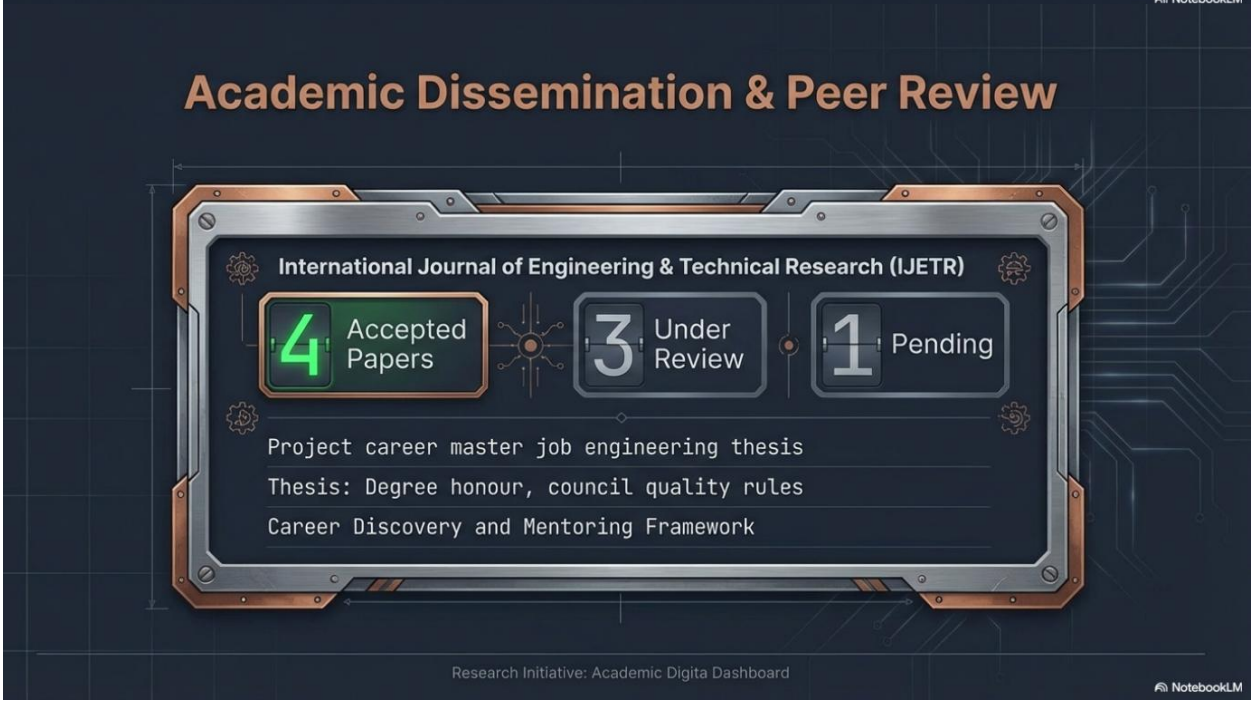
Technical Pillar II: Digital Transformation & Cloud Infrastructure.
JetBrains Mono
Data Warehousing & Querying
Microsoft Learn Plan
Invitation
Discover Data Concepts.
Institutional Use
Azure AI
Knowledge Mining & AI Agents
Microsoft Purview
Data Security
NotebookLM

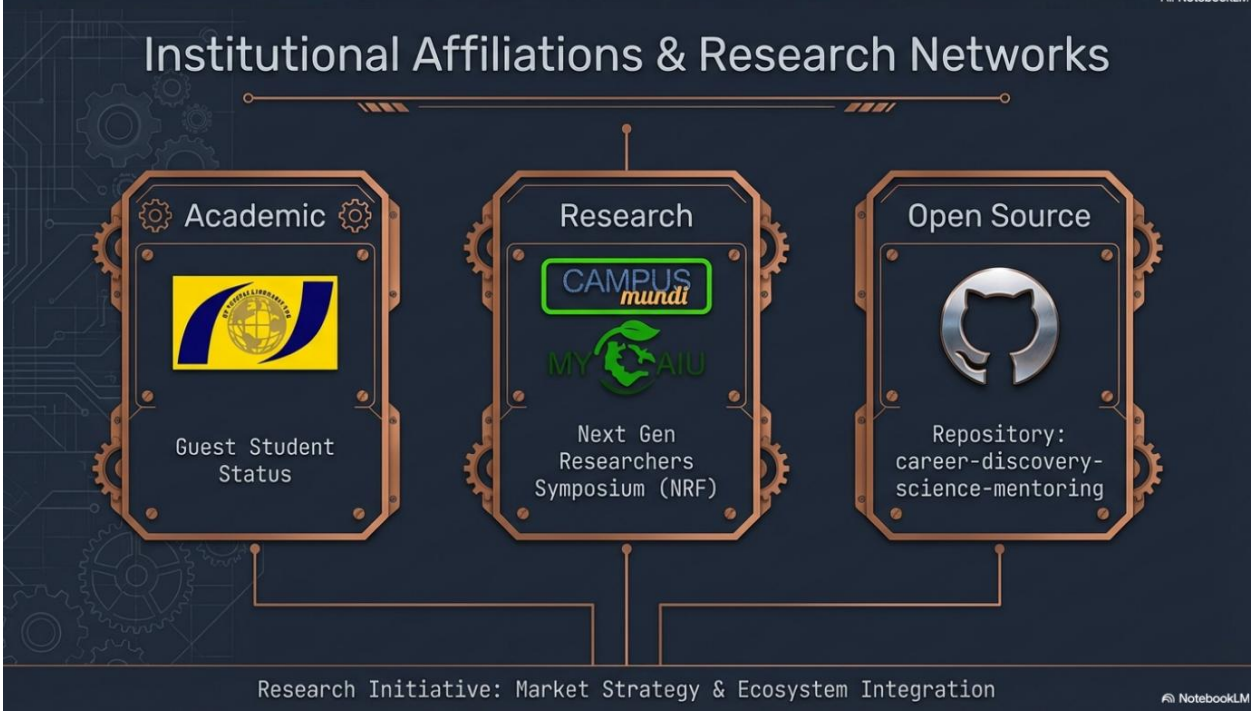

Technical Pillar III: Industrial IoT & Smart Grid Optimization.
Smart Grid Performance
Fault detection and load management optimization.
Power
Data
Cisco IoT Hardware
Solar Panels
Renewable Integration
Monitoring hybrid Solar/ Grid efficiency.
Traffic vs. Power
Correlating network data traffic with energy consumption.
Industrial Automation Units
Research Initiative: NSF Project Pitch #00100839
NotebookLM

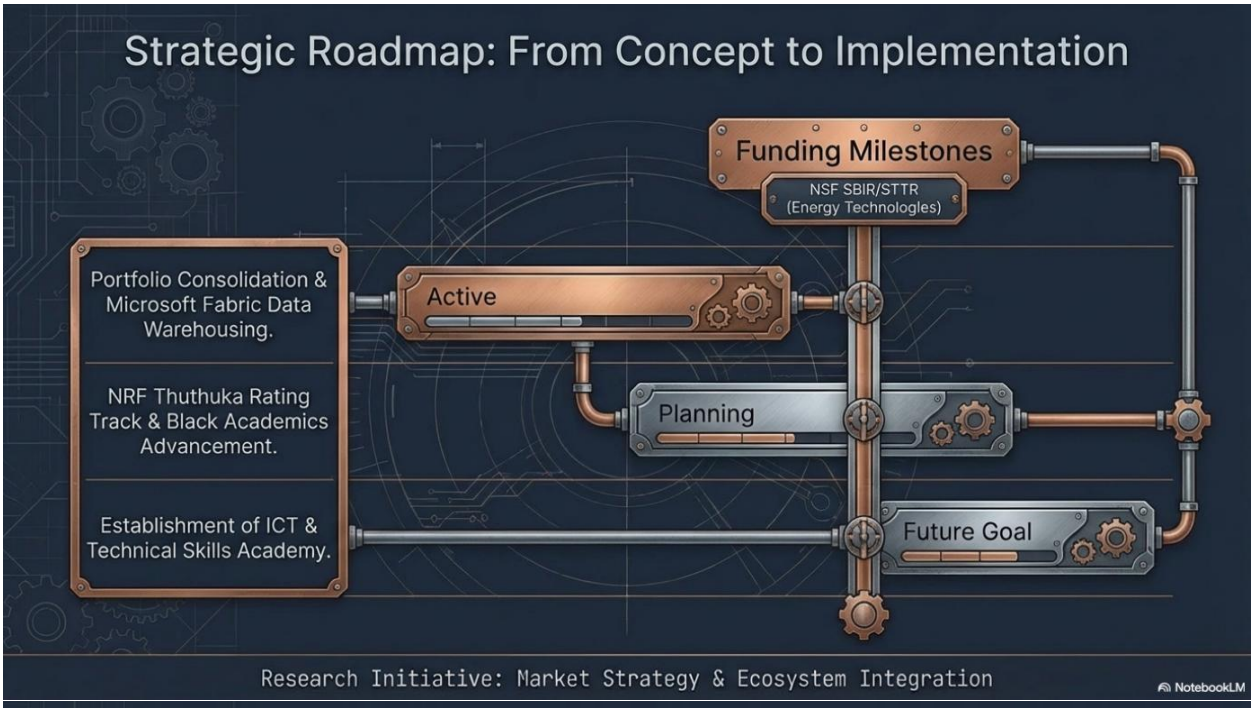

Proprietary Automation: The VBA Form Control System.
UserForm Initialization
reset_form()
Fault Analysis Calculation
UserForm
VBA Macro & Form Control System
UserForms Breakdown
Registration
Analysis
Analysis
Fault Logic
Fault Logic
ProeckDoek
UserForms
Automated Student Registration
Engineering Drawing Analysis
Three-Phase Fault Logic
Run
Reset
Exit
Research Initiative: VBA Automation Project #00100840
NotebookLM
Research Initiative: AI-Driven Educational Analytics
> Pattern Recognition: Predicting success rates.
> Psychometrics: Identifying learning barriers.
> Neurodevelopmental Assessment: Accommodation planning.
> Outcome: Verifiable Digital Portfolios.
NotebookLM

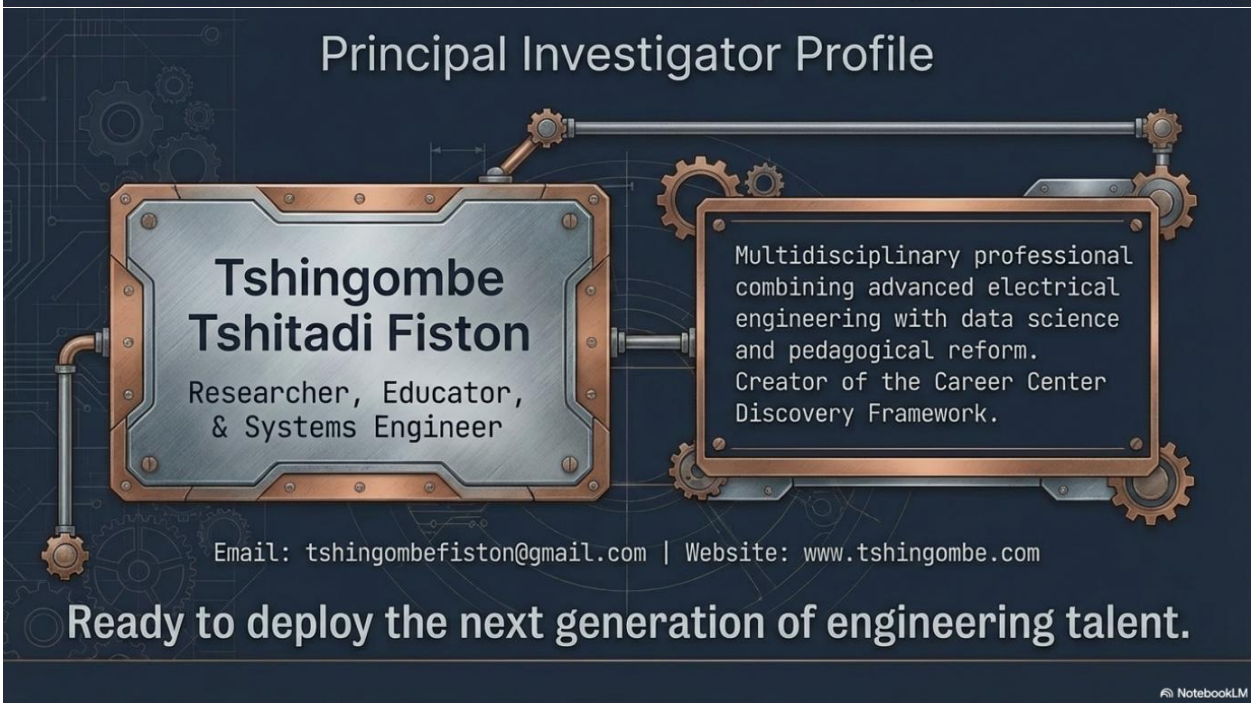

Market Opportunity & Strategic Alignment
Vocational Education
(TVET/DHET)
Curriculum mapping &
Compliance
The
Framework
Industrial Utilities
(Eskom/City Power)
Technical Training
Modules
Certification Bodies
(QCTO/Umalusi)
Assessment
Standardization
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM

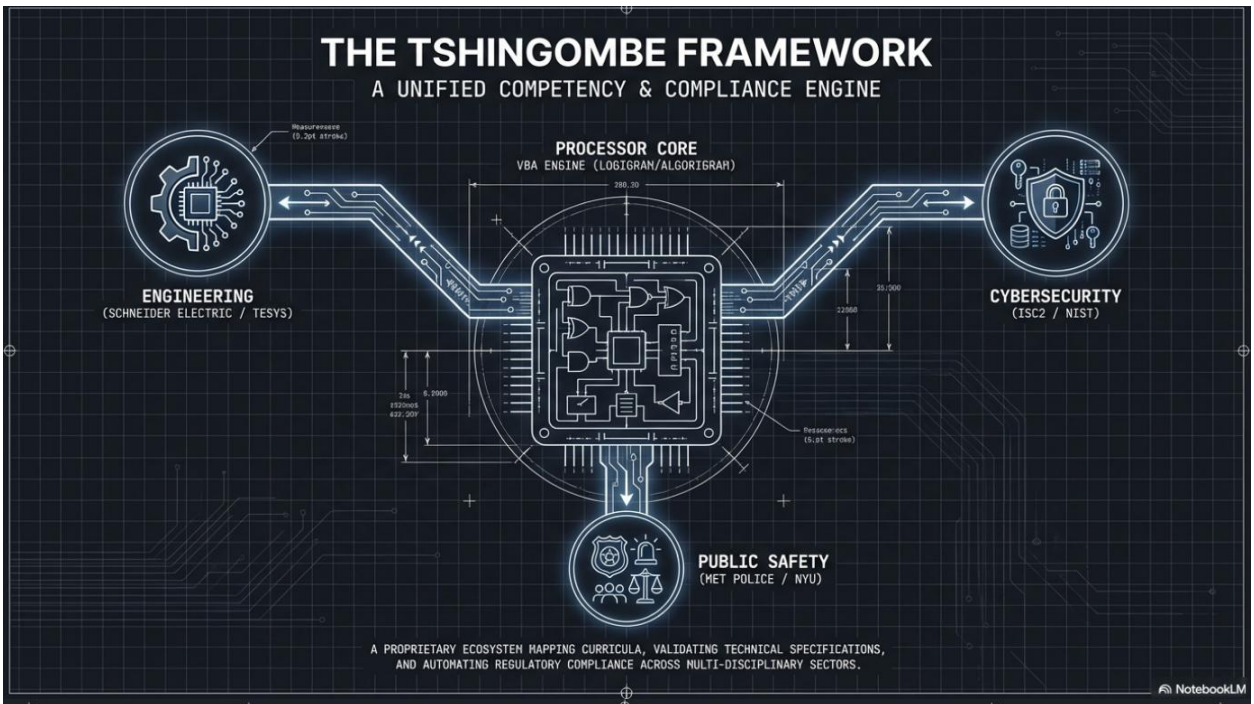

Academic Dissemination & Peer Review
International Journal of Engineering & Technical Research (IJETR)
4 Accepted Papers
3 Under Review
1 Pending
Project career master job engineering thesis
Thesis: Degree honour, council quality rules
Career Discovery and Mentoring Framework
Research Initiative: Academic Digita Dashboard
NotebookLM

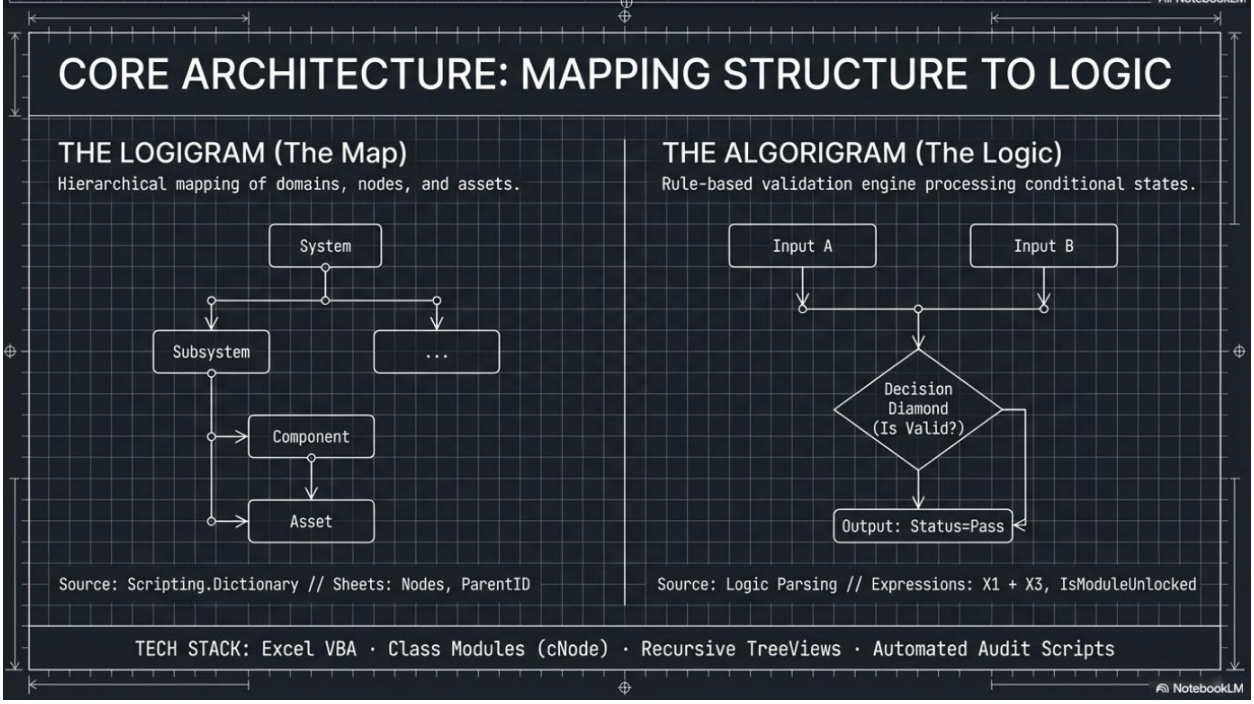
Continuous Professional Development (CPD)
Alison Diploma in Electrical Studies
Project Management
Microsoft Certified: Azure AI Engineer Associate (In Progress)
Digital Badge
Certificate
In Progress
Performance Metric
Top percentile in abstract reasoning and numeracy aptitude tests.
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM

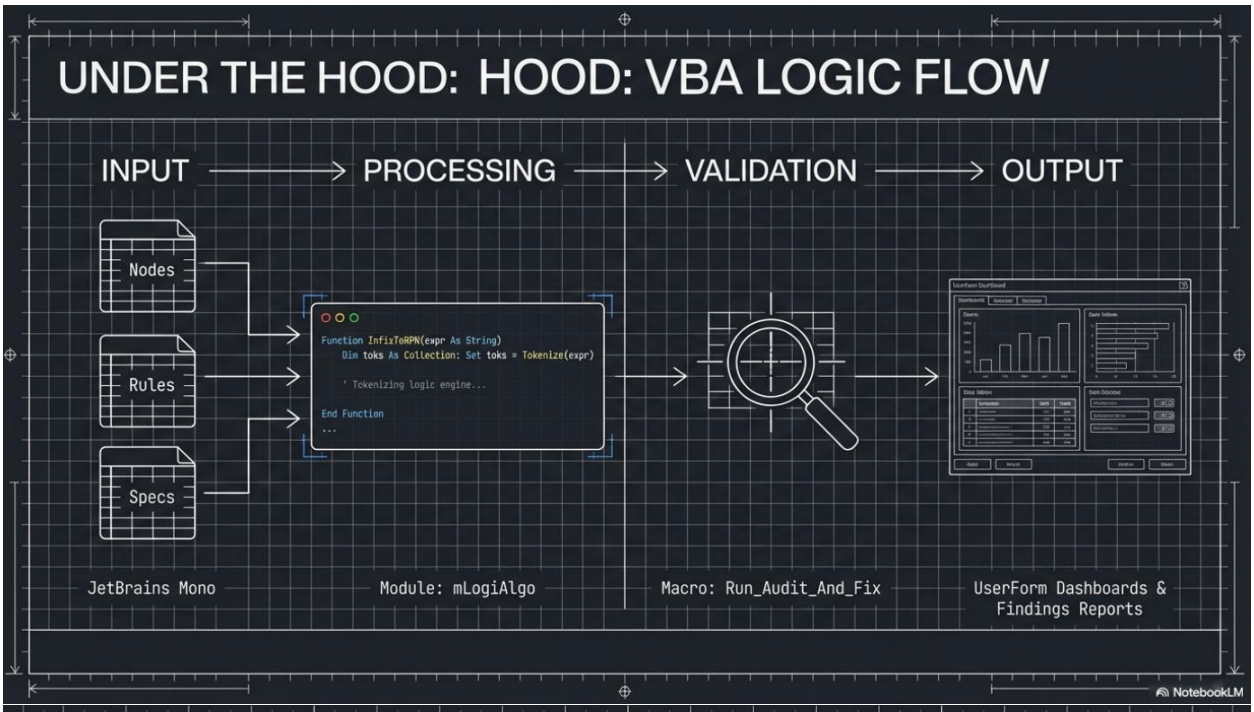

Institutional Affiliations & Research Networks
Academic
Guest Student Status
Research
CAMPUS mundi
MY AIU
Next Gen Researchers Symposium (NRF)
Open Source
Repository: career-discovery-science-mentoring
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM

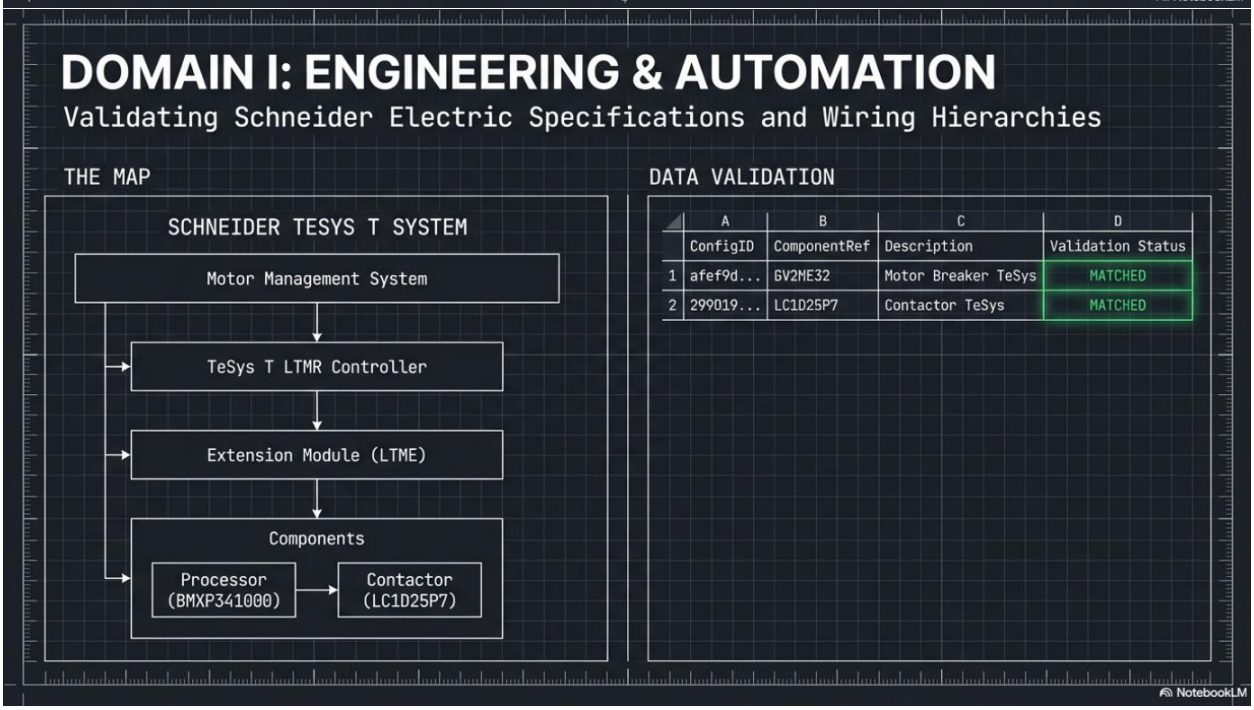

Strategic Roadmap: From Concept to Implementation
Funding Milestones
NSF SBIR/STTR
(Energy Technologies)
Portfolio Consolidation & Microsoft Fabric Data Warehousing.
NRF Thuthuka Rating Track & Black Academics Advancement.
Establishment of ICT & Technical Skills Academy.
Active
Planning
Future Goal
Research Initiative: Market Strategy & Ecosystem Integration
NotebookLM

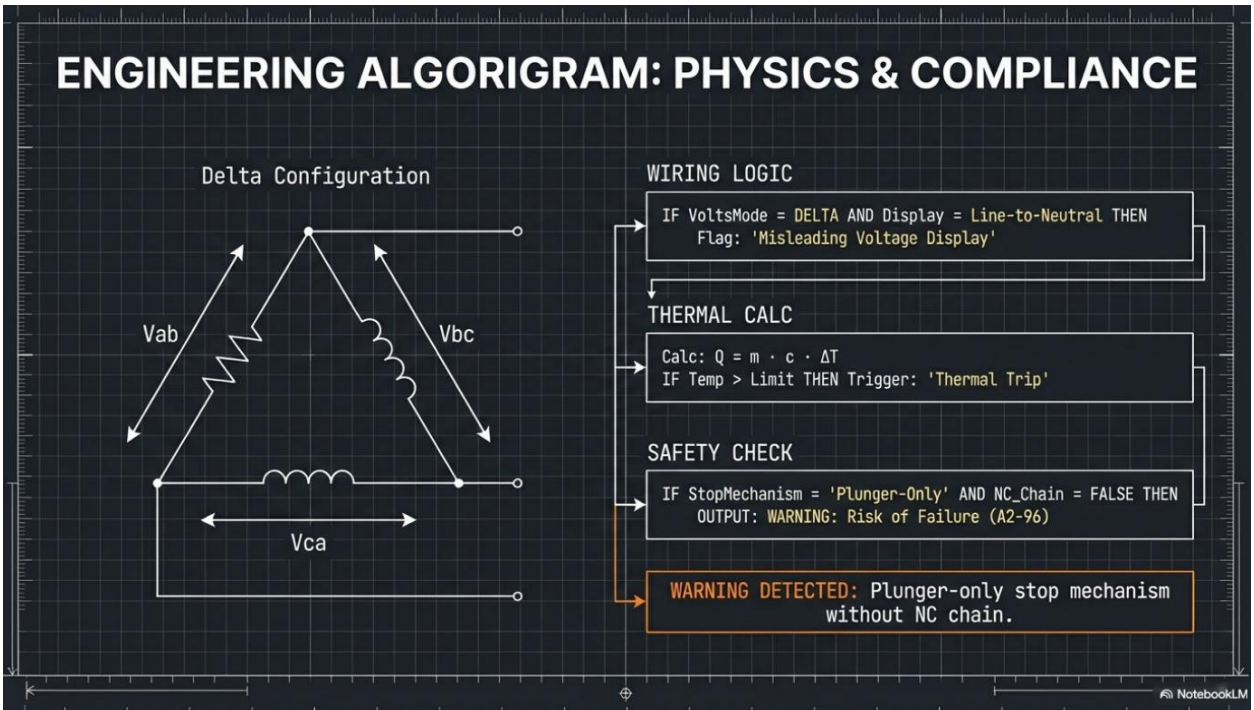

Principal Investigator Profile
Tshingombe Tshitadi Fiston
Researcher, Educator, & Systems Engineer
Multidisciplinary professional combining advanced electrical engineering with data science and pedagogical reform.
Creator of the Career Center Discovery Framework.
Email: tshingombefiston@gmail.com | Website: www.tshingombe.com
Ready to deploy the next generation of engineering talent.
NotebookLM

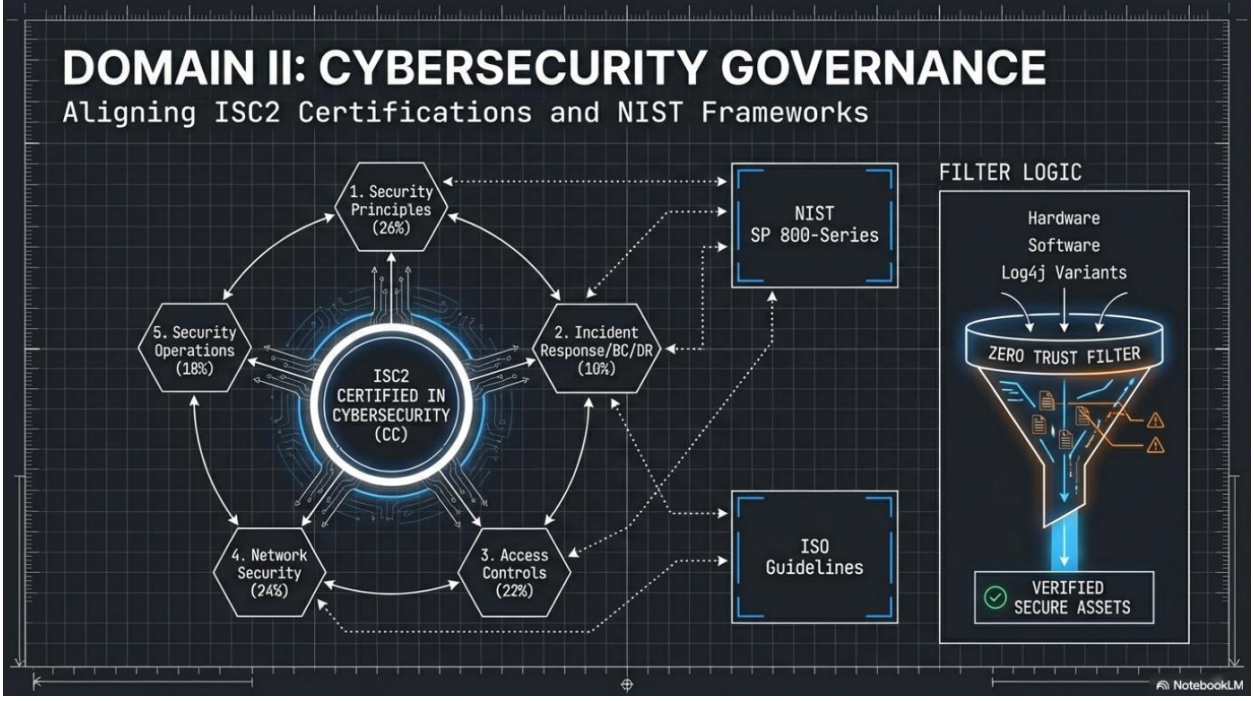

THE TSHINGOMBE FRAMEWORK
A UNIFIED COMPETENCY & COMPLIANCE ENGINE
PROCESSOR CORE
VBA ENGINE (LOGIGRAN/ALGORIGRAH)
ENGINEERING
(SCHNEIDER ELECTRIC / TESYS)
CYBERSECURITY
(ISC2 / NIST)
PUBLIC SAFETY
(MET POLICE / NYU)
A PROPRIETARY ECOSYSTEM MAPPING CURRICULA, VALIDATING TECHNICAL SPECIFICATIONS,
AND AUTOMATING REGULATORY COMPLIANCE ACROSS MULTI-DISCIPLINARY SECTORS.
NotebookLM

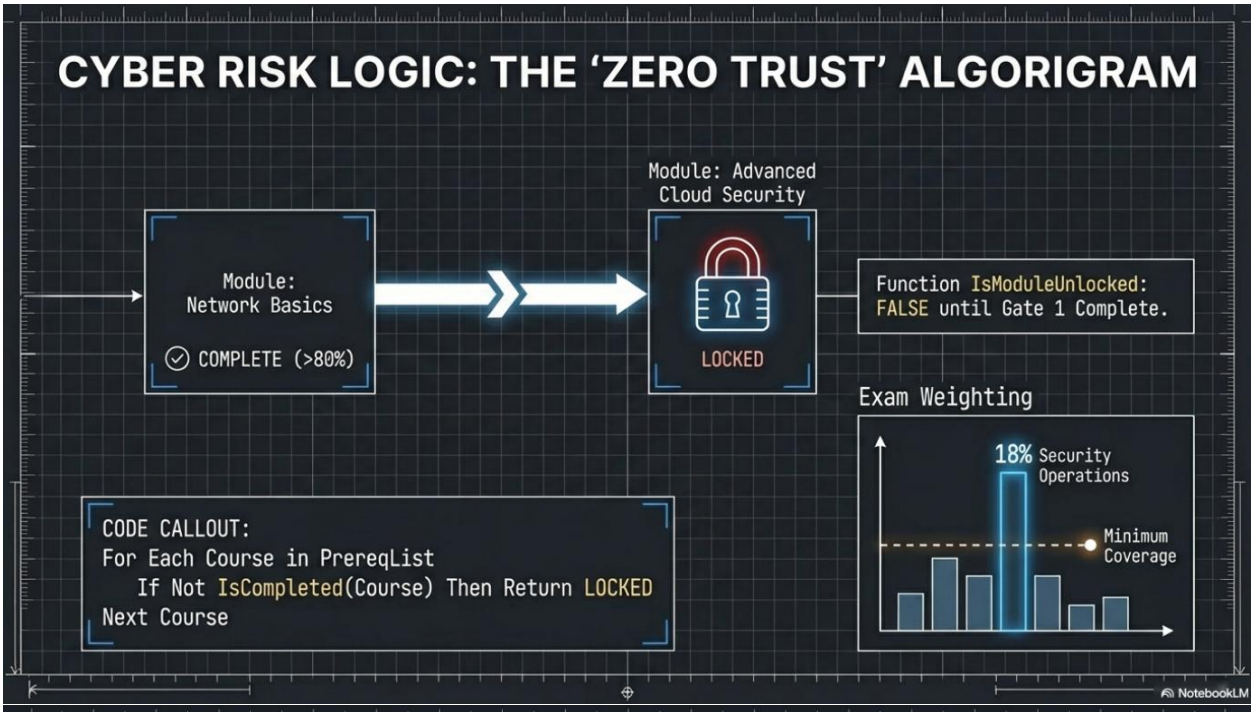

CORE ARCHITECTURE: MAPPING STRUCTURE TO LOGIC
THE LOGIGRAM (The Map)
Hierarchical mapping of domains, nodes, and assets.
System
Subsystem
...
Component
Asset
Source: Scripting.Dictionary // Sheets: Nodes, ParentID
THE ALGORIGRAM (The Logic)
Rule-based validation engine processing conditional states.
Input A
Input B
Decision Diamond (Is Valid?)
Output: Status=Pass
Source: Logic Parsing // Expressions: X1 + X3, IsModuleUnlocked
TECH STACK: Excel VBA · Class Modules (cNode) · Recursive TreeViews · Automated Audit Scripts
NotebookLM

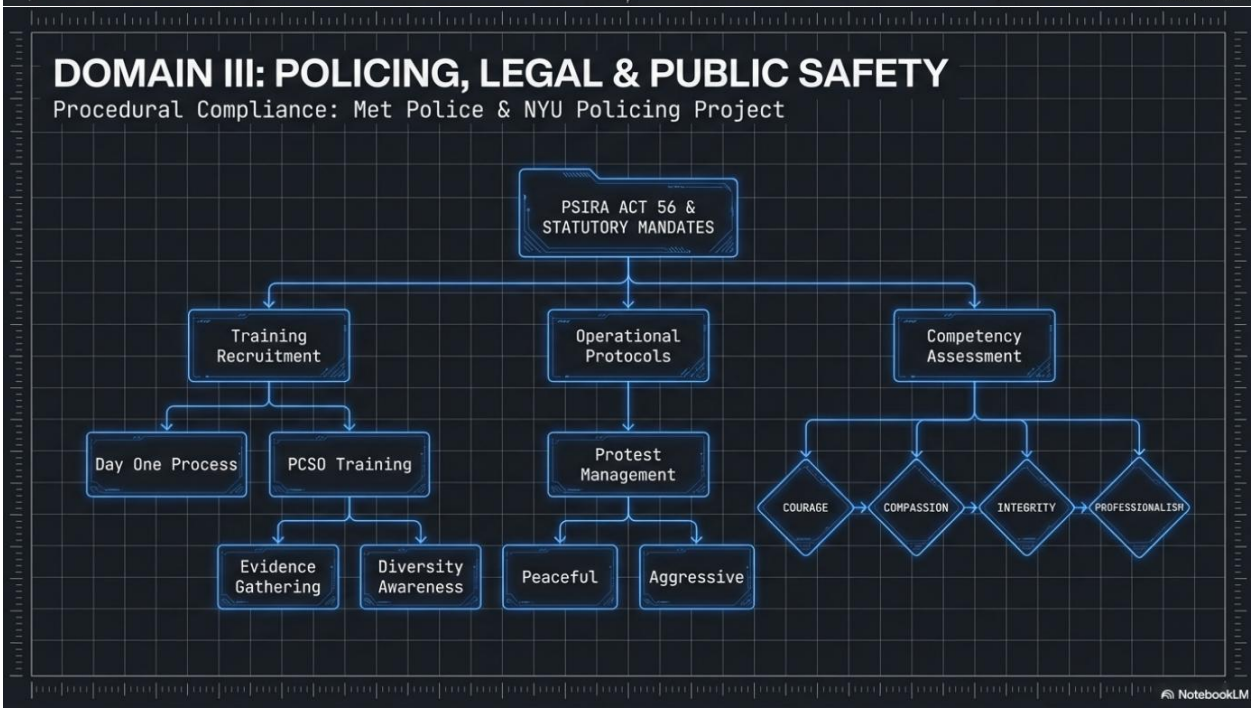

UNDER THE HOOD: HOOD: VBA LOGIC FLOW
INPUT
PROCESSING
VALIDATION
OUTPUT
Nodes
Rules
Specs
Function InfixToRPN(expr As String)
Dim toks As Collection: Set toks = Tokenize(expr)
' Tokenizing logic engine...
End Function
...
JetBrains Mono
Module: mLogiAlgo
Macro: Run_Audit_And_Fix
UserForm Dashboards & Findings Reports
NotebookLM

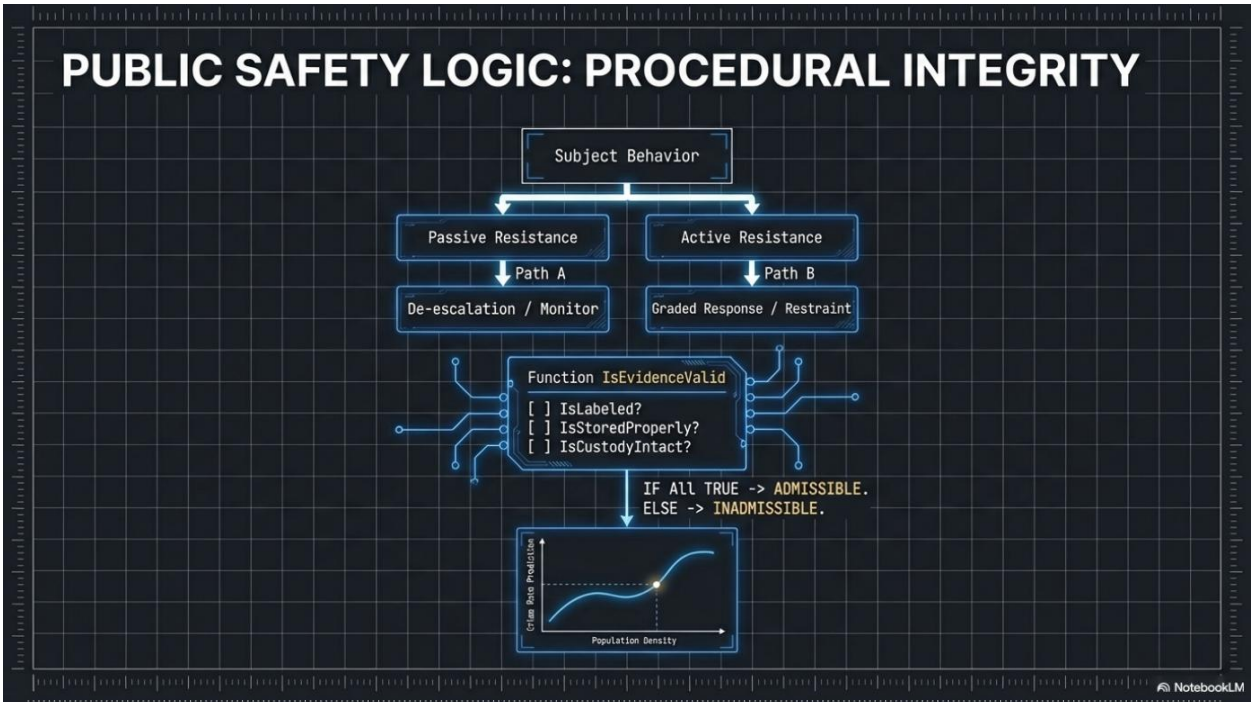

DOMAIN I: ENGINEERING & AUTOMATION
Validating Schneider Electric Specifications and Wiring Hierarchies
THE MAP
SCHNEIDER TESYS T SYSTEM
Motor Management System
TeSys T LTMR Controller
Extension Module (LTME)
Components
Processor (BMXP341000)
Contactor (LC1D25P7)
DATA VALIDATION
A
B
C
D
ConfigID
ComponentRef
Description
Validation Status
1
afef9d...
GV2ME32
Motor Breaker TeSys
MATCHED
2
299019...
LC1D25P7
Contactor TeSys
MATCHED
NotebookLM

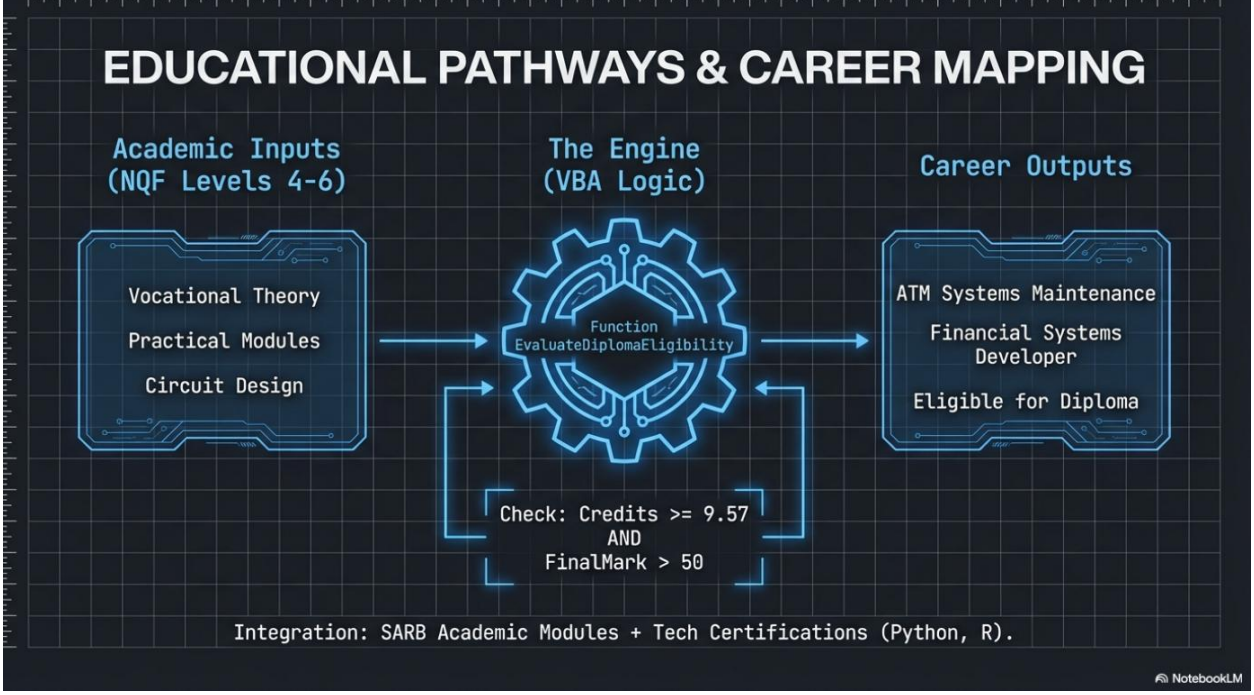

ENGINEERING ALGORIGRAM: PHYSICS & COMPLIANCE
Delta Configuration
Vab
Vbc
Vca
WIRING LOGIC
IF VoltsMode = DELTA AND Display = Line-to-Neutral THEN
Flag: 'Misleading Voltage Display'
THERMAL CALC
Calc: Q = m · c · ΔT
IF Temp > Limit THEN Trigger: 'Thermal Trip'
SAFETY CHECK
IF StopMechanism = 'Plunger-Only' AND NC_Chain = FALSE THEN
OUTPUT: WARNING: Risk of Failure (A2-96)
WARNING DETECTED: Plunger-only stop mechanism without NC chain.
NotebookLM

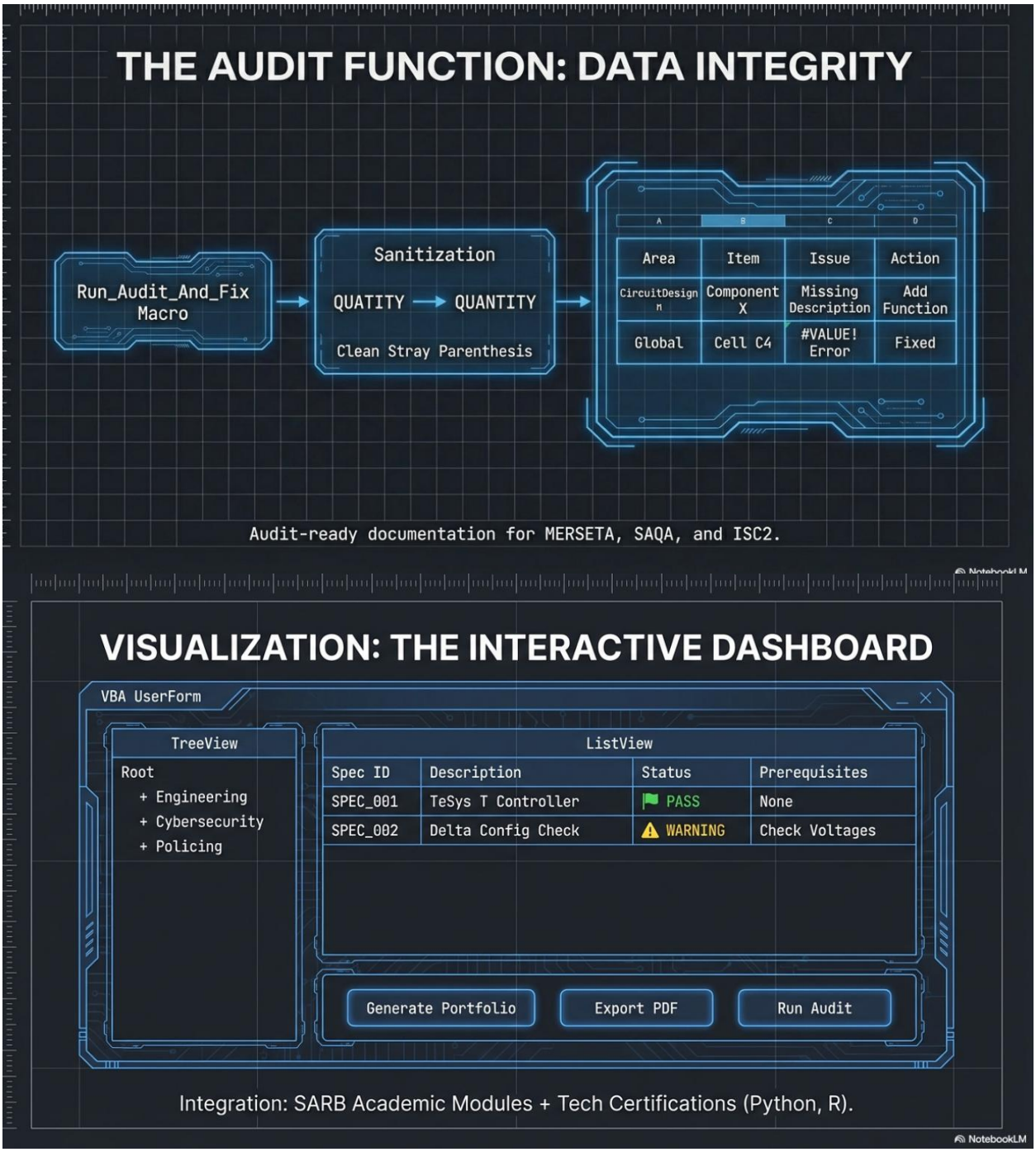

DOMAIN II: CYBERSECURITY GOVERNANCE
Aligning ISC2 Certifications and NIST Frameworks
1. Security Principles (26%)
2. Incident Response/BC/DR (10%)
3. Access Controls (22%)
4. Network Security (24%)
5. Security Operations (18%)
ISC2 CERTIFIED IN CYBERSECURITY (CC)
NIST SP 800-Series
ISO Guidelines
FILTER LOGIC
Hardware
Software
Log4j Variants
ZERO TRUST FILTER
VERIFIED SECURE ASSETS
NotebookLM

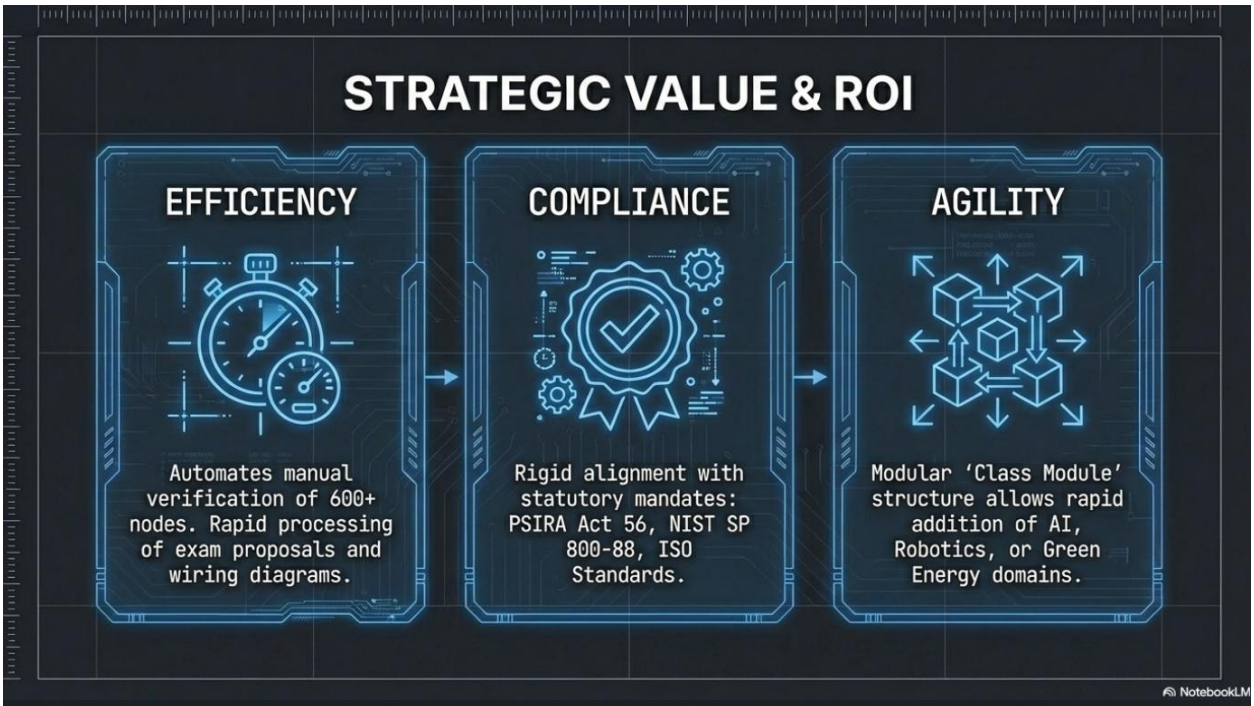

CYBER RISK LOGIC: THE 'ZERO TRUST' ALGORIGRAM
Module: Advanced Cloud Security
Module: Network Basics
COMPLETE (>80%)
LOCKED
Function IsModuleUnlocked: FALSE until Gate 1 Complete.
Exam Weighting
18% Security Operations
Minimum Coverage
CODE CALLOUT:
For Each Course in PrereqList
If Not IsCompleted(Course) Then Return LOCKED
Next Course
NotebookLM

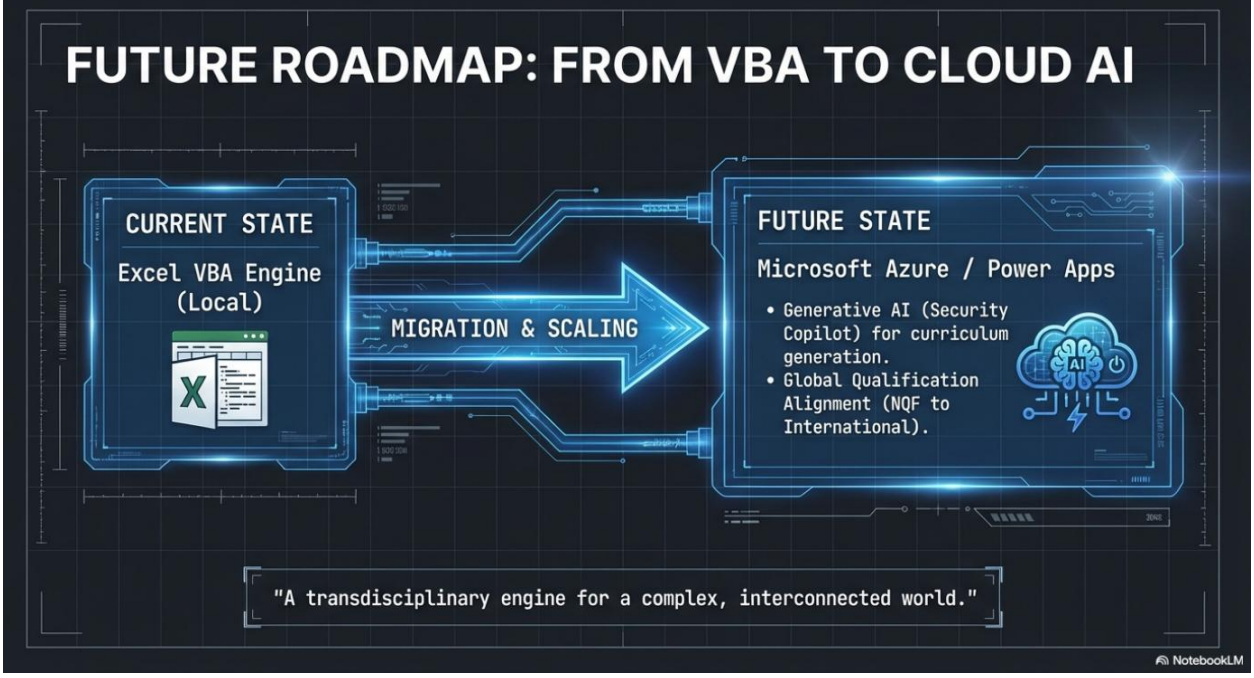

DOMAIN III: POLICING, LEGAL & PUBLIC SAFETY
Procedural Compliance: Met Police & NYU Policing Project
PSIRA ACT 56 & STATUTORY MANDATES
Training Recruitment
Operational Protocols
Competency Assessment
Day One Process
PCSO Training
Protest Management
COURAGE
COMPASSION
INTEGRITY
PROFESSIONALISM
Evidence Gathering
Diversity Awareness
Peaceful
Aggressive
NotebookLM

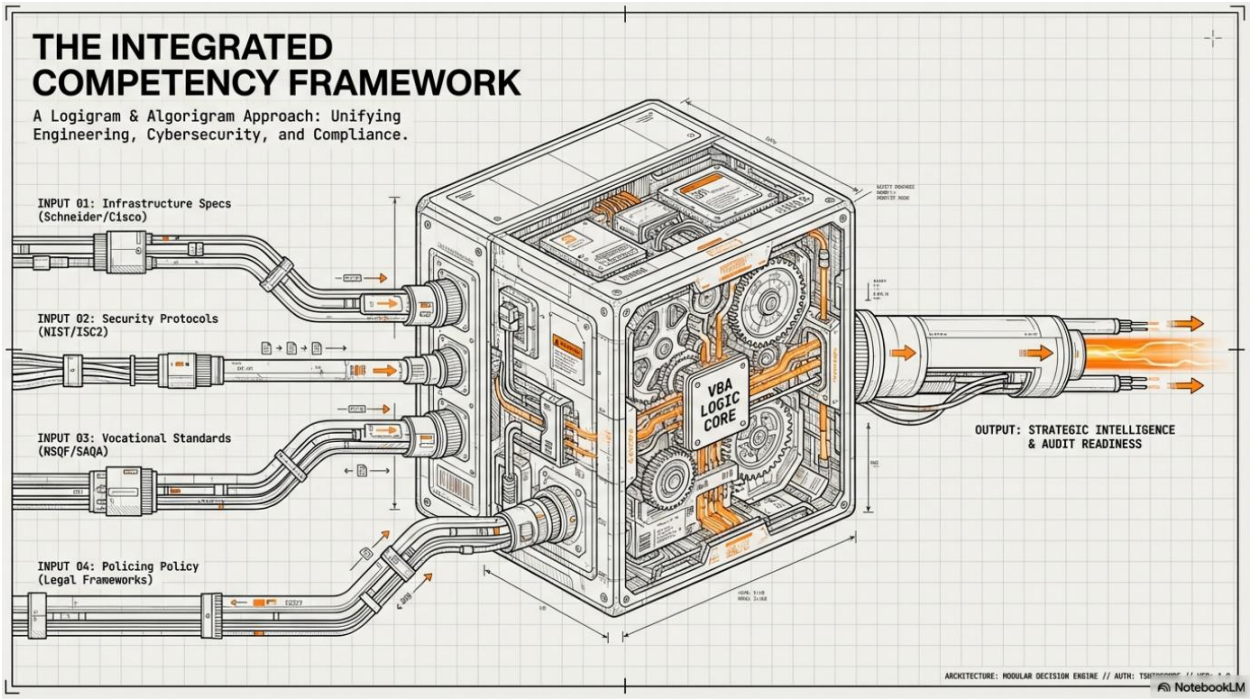

PUBLIC SAFETY LOGIC: PROCEDURAL INTEGRITY
Subject Behavior
Passive Resistance
Active Resistance
Path A
Path B
De-escalation / Monitor
Graded Response / Restraint
Function IsEvidenceValid
[ ] IsLabeled?
[ ] IsStoredProperly?
[ ] IsCustodyIntact?
IF All TRUE -> ADMISSIBLE.
ELSE -> INADMISSIBLE.
Crime Rate Predictor
Population Density
NotebookLM

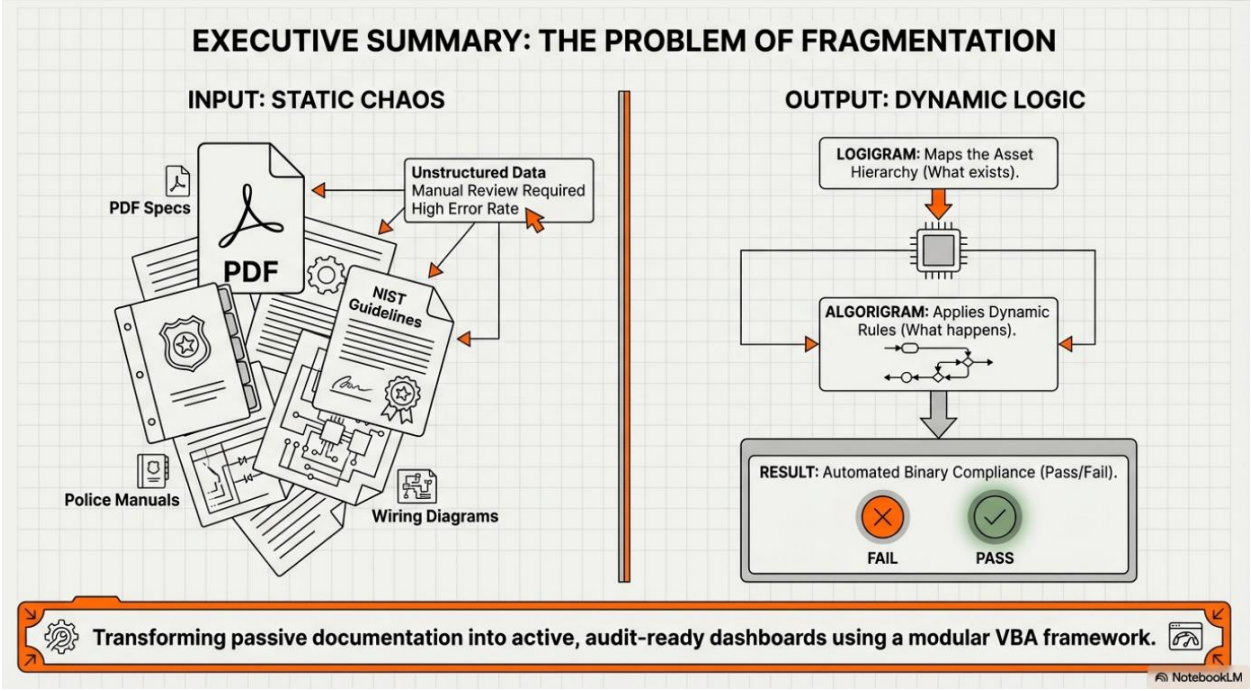

EDUCATIONAL PATHWAYS & CAREER MAPPING
Academic Inputs
(NQF Levels 4-6)
The Engine
(VBA Logic)
Career Outputs
Vocational Theory
Practical Modules
Circuit Design
Function
EvaluateDiplomaEligibility
ATM Systems Maintenance
Financial Systems
Developer
Eligible for Diploma
Check: Credits >= 9.57
AND
FinalMark > 50
Integration: SARB Academic Modules + Tech Certifications (Python, R).
NotebookLM

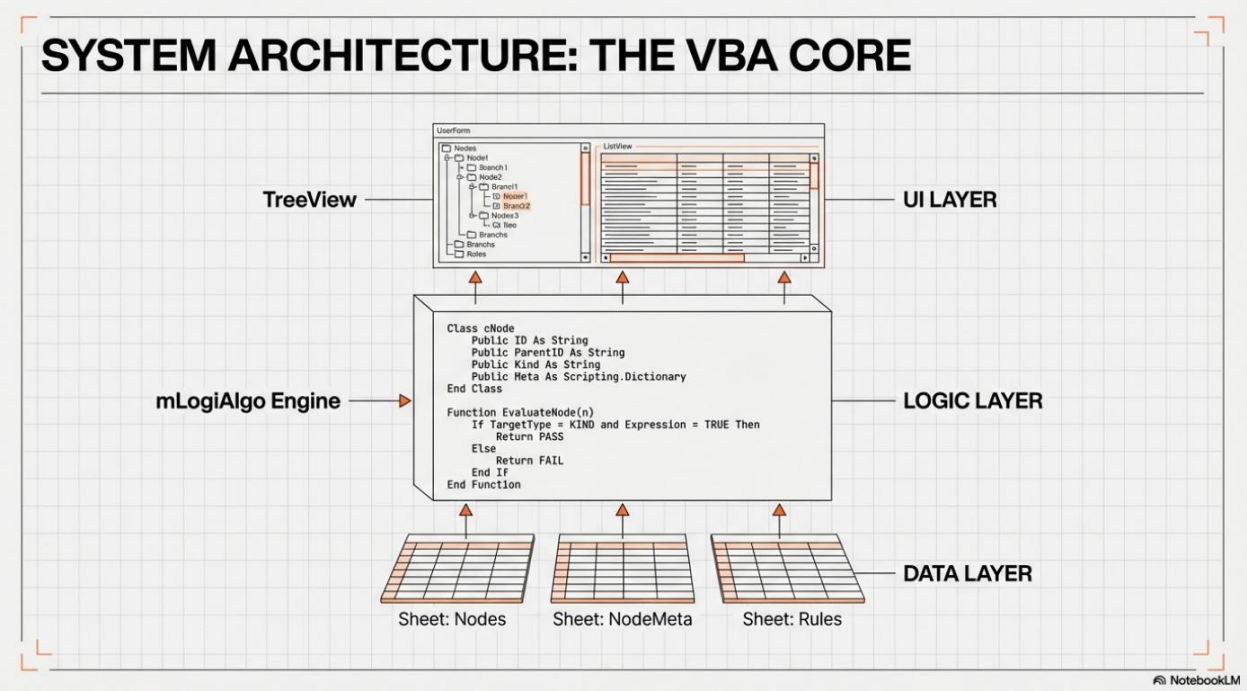

THE AUDIT FUNCTION: DATA INTEGRITY
Run_Audit_And_Fix Macro
Sanitization
QUATITY → QUANTITY
Clean Stray Parenthesis
A
B
C
D
Area
Item
Issue
Action
CircuitDesign
Component X
Missing Description
Add Function
Global
Cell C4
#VALUE! Error
Fixed
Audit-ready documentation for MERSETA, SAQA, and ISC2.
VISUALIZATION: THE INTERACTIVE DASHBOARD
VBA UserForm
TreeView
Root
+ Engineering
+ Cybersecurity
+ Policing
ListView
Spec ID
Description
Status
Prerequisites
SPEC_001
TeSys T Controller
PASS
None
SPEC_002
Delta Config Check
WARNING
Check Voltages
Generate Portfolio
Export PDF
Run Audit
Integration: SARB Academic Modules + Tech Certifications (Python, R).
NotebookLM


STRATEGIC VALUE & ROI
EFFICIENCY
Automates manual verification of 600+ nodes. Rapid processing of exam proposals and wiring diagrams.
COMPLIANCE
Rigid alignment with statutory mandates: PSIRA Act 56, NIST SP 800-88, ISO Standards.
AGILITY
Modular 'Class Module' structure allows rapid addition of AI, Robotics, or Green Energy domains.
NotebookLM


FUTURE ROADMAP: FROM VBA TO CLOUD AI
CURRENT STATE
Excel VBA Engine (Local)
MIGRATION & SCALING
FUTURE STATE
Microsoft Azure / Power Apps
• Generative AI (Security Copilot) for curriculum generation.
• Global Qualification Alignment (NQF to International).
"A transdisciplinary engine for a complex, interconnected world."
NotebookLM

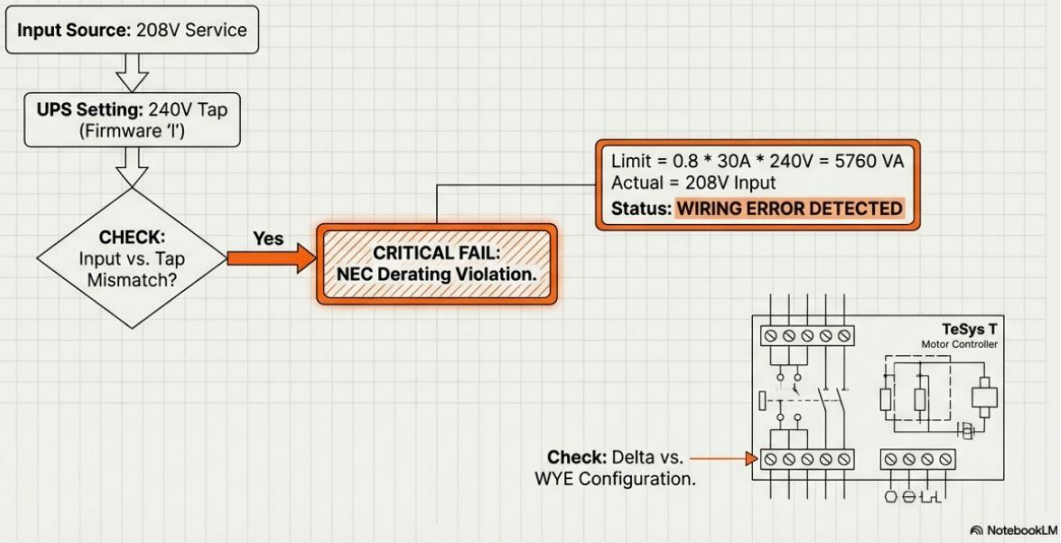

THE INTEGRATED COMPETENCY FRAMEWORK
A Logigram & Algorigram Approach: Unifying Engineering, Cybersecurity, and Compliance.
INPUT 01: Infrastructure Specs (Schneider/Cisco)
INPUT 02: Security Protocols (NIST/ISC2)
INPUT 03: Vocational Standards (RSQF/SAQA)
INPUT 04: Policing Policy (Legal Frameworks)
VBA LOGIC CORE
OUTPUT: STRATEGIC INTELLIGENCE & AUDIT READINESS
NotebookLM


EXECUTIVE SUMMARY: THE PROBLEM OF FRAGMENTATION
INPUT: STATIC CHAOS
PDF Specs
PDF
Unstructured Data
Manual Review Required
High Error Rate
NIST Guidelines
Police Manuals
Wiring Diagrams
OUTPUT: DYNAMIC LOGIC
LOGIGRAM: Maps the Asset Hierarchy (What exists).
ALGORIGRAM: Applies Dynamic Rules (What happens).
RESULT: Automated Binary Compliance (Pass/Fail).
FAIL
PASS
Transforming passive documentation into active, audit-ready dashboards using a modular VBA framework.
NotebookLM


SYSTEM ARCHITECTURE: THE VBA CORE
TreeView
UI LAYER
mLogiAlgo Engine
LOGIC LAYER
DATA LAYER
Sheet: Nodes
Sheet: NodeMeta
Sheet: Rules
Class cNode
Public ID As String
Public ParentID As String
Public Kind As String
Public Meta As Scripting.Dictionary
End Class
Function EvaluateNode(n)
If TargetType = KIND and Expression = TRUE Then
Return PASS
Else
Return FAIL
End If
End Function
NotebookLM

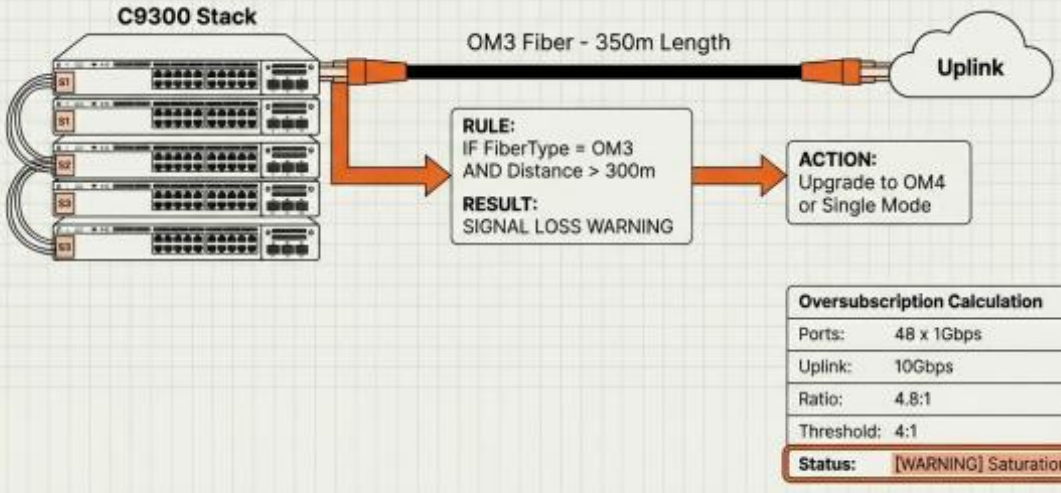
MODULE A: POWER SYSTEMS VALIDATION

Source: Schneider Electric UPS Specs & TeSys Motor Management

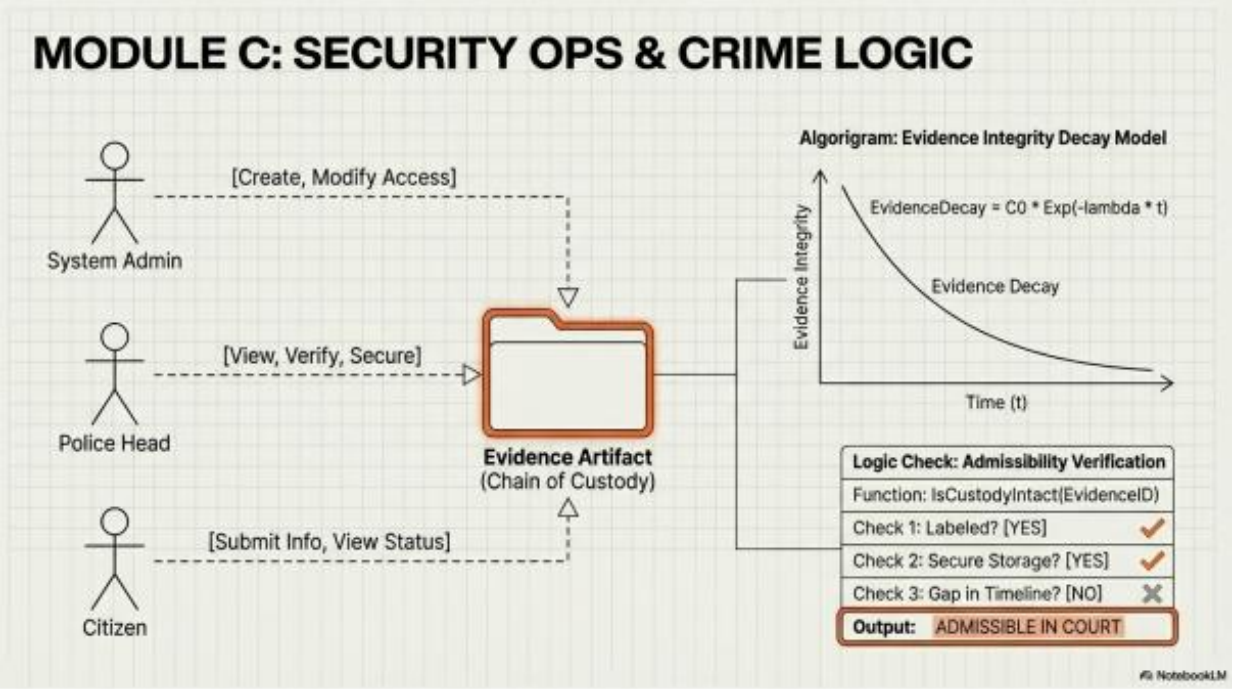

Input Source: 208V Service
UPS Setting: 240V Tap (Firmware 'I')
CHECK: Input vs. Tap Mismatch?
Yes
CRITICAL FAIL: NEC Derating Violation.
Limit = 0.8 * 30A * 240V = 5760 VA
Actual = 208V Input
Status: WIRING ERROR DETECTED
TeSys T
Motor Controller
Check: Delta vs. WYE Configuration.
NotebookLM

MODULE B: NETWORK ARCHITECTURE LOGIC

Automated Bandwidth & Fiber Compatibility Checks



Oversubscription Calculation	
Ports:	48 x 1Gbps
Uplink:	10Gbps
Ratio:	4.8:1
Threshold:	4:1
Status:	[WARNING] Saturation Risk


MODULE C: SECURITY OPS & CRIME LOGIC
System Admin
[Create, Modify Access]
Police Head
[View, Verify, Secure]
Citizen
[Submit Info, View Status]
Evidence Artifact
(Chain of Custody)
Algorigram: Evidence Integrity Decay Model
Evidence Integrity
EvidenceDecay = C0 * Exp(-lambda * t)
Evidence Decay
Time (t)
Logic Check: Admissibility Verification
Function: IsCustodyIntact(EvidenceID)
Check 1: Labeled? [YES]
Check 2: Secure Storage? [YES]
Check 3: Gap in Timeline? [NO]
Output: ADMISSIBLE IN COURT

AUTOMATED COMPLIANCE AUDITING

Compliance Matrix

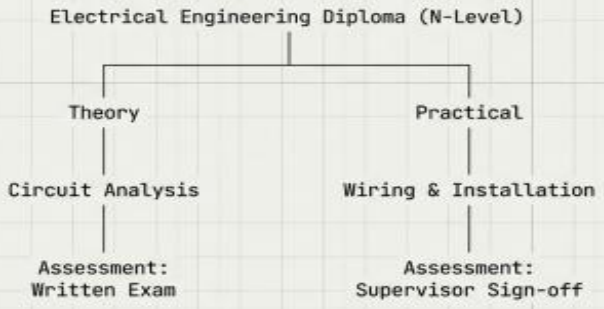
Training Module	ISC2 Domain	NIST Reference	Status
Data Security	Security Ops	NIST SP 800-88	[COMPLIANT]
Network Threats	Network Security	NIST SP 800-137	[COMPLIANT]
Access Control	Identity Mgmt	NIST SP 800-63	[PENDING]

CPE Credit Progress

```
IF Score > 700 AND Module = "System Hardening" THEN Compliance = TRUE
```

MODULE D: EDUCATIONAL GOVERNANCE ENGINE

Tree View of Vocational Curriculum

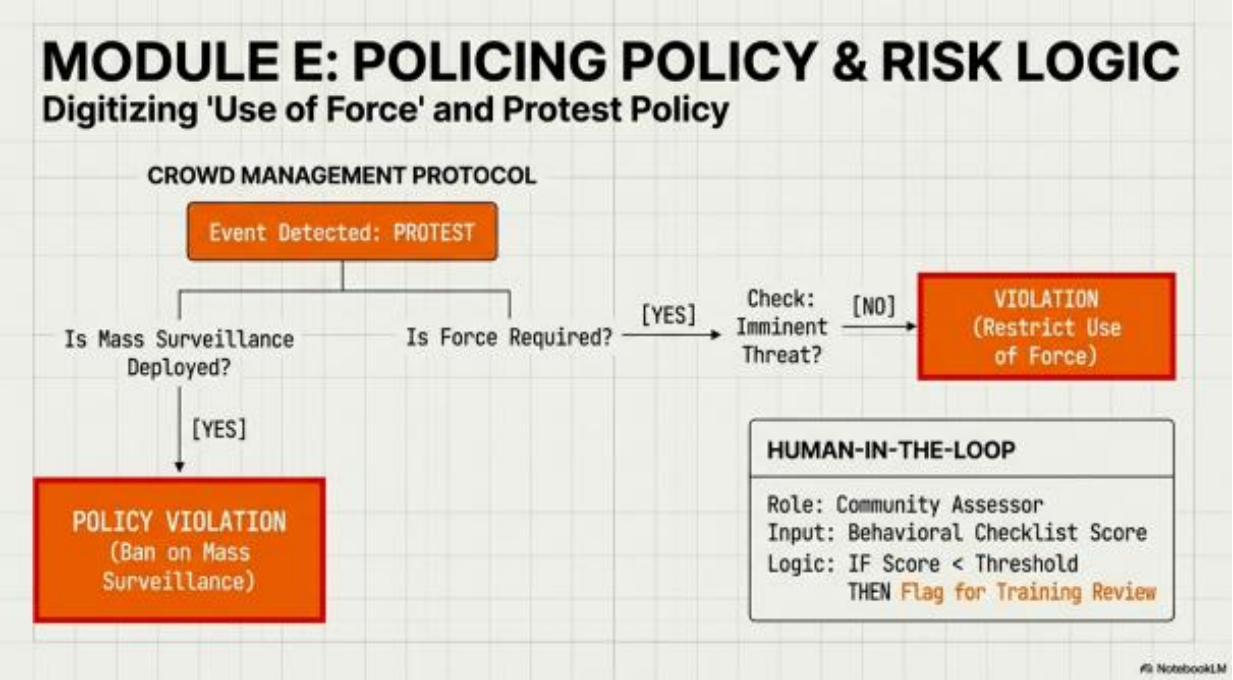


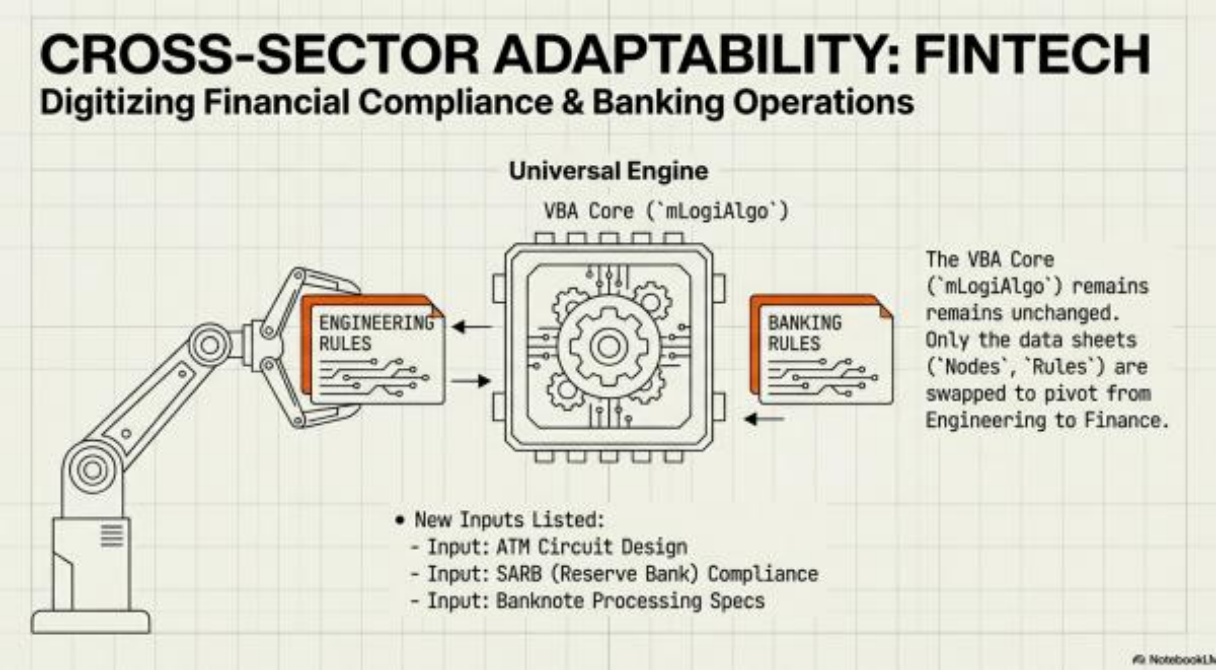
Algorigram: Diploma Eligibility Calculator

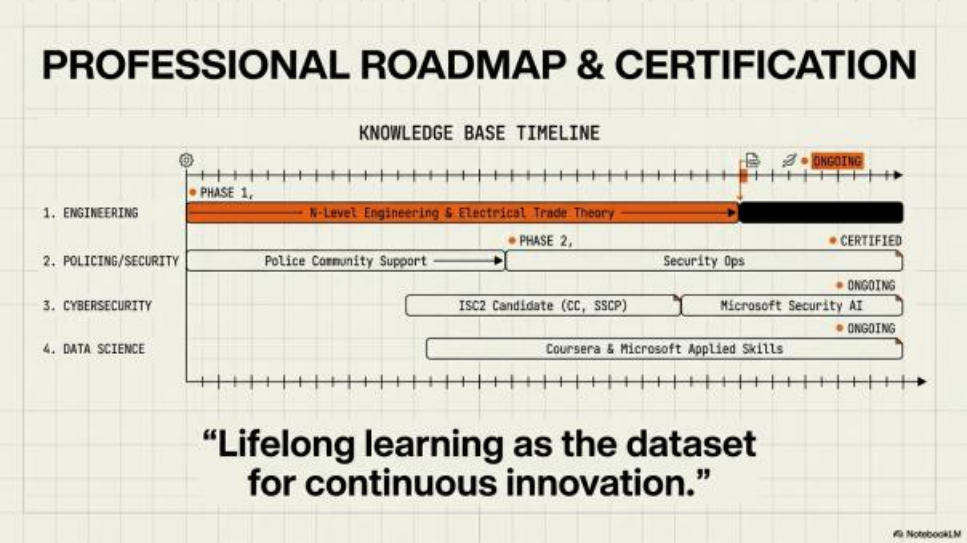
```
Input: Student Credits = 9.57
Rule: IF Credits >= 9.57
      THEN Award_Diploma
---
Result: [ELIGIBLE]
```

Irregularity Tracker (Alert Box)

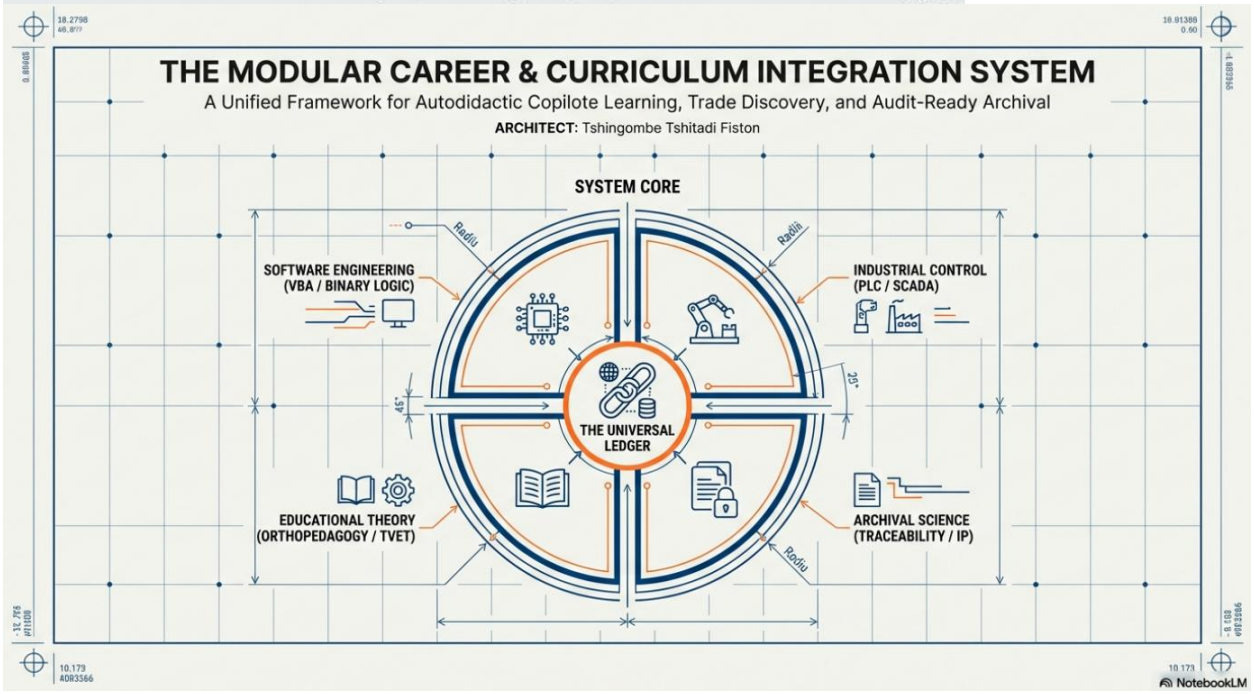
```
Flag: Mark < 50%
Flag: Audit Irregularity = 'YES'
---
Action: TRIGGER MODERATION REVIEW
```

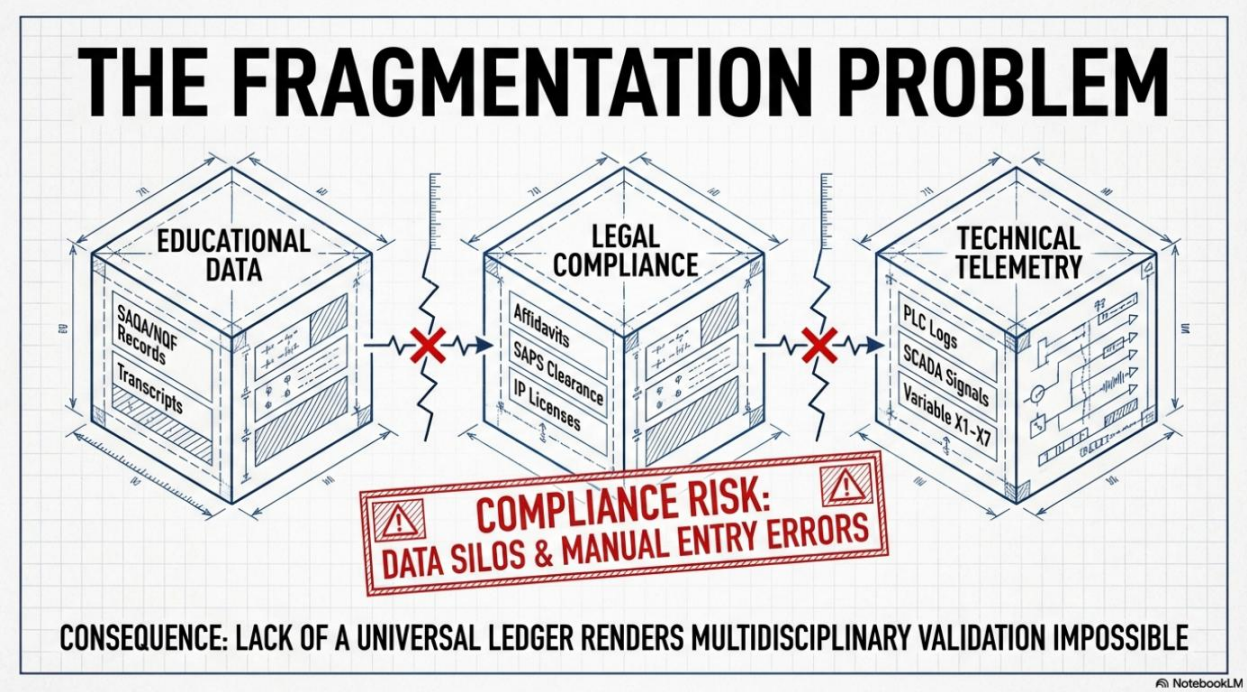

MODULE E: POLICING POLICY & RISK LOGIC
Digitizing 'Use of Force' and Protest Policy
CROWD MANAGEMENT PROTOCOL
Event Detected: PROTEST
Is Mass Surveillance Deployed?
[YES]
POLICY VIOLATION (Ban on Mass Surveillance)
Is Force Required?
[YES]
Check: Imminent Threat?
[NO]
VIOLATION (Restrict Use of Force)
HUMAN-IN-THE-LOOP
Role: Community Assessor
Input: Behavioral Checklist Score
Logic: IF Score < Threshold
THEN Flag for Training Review

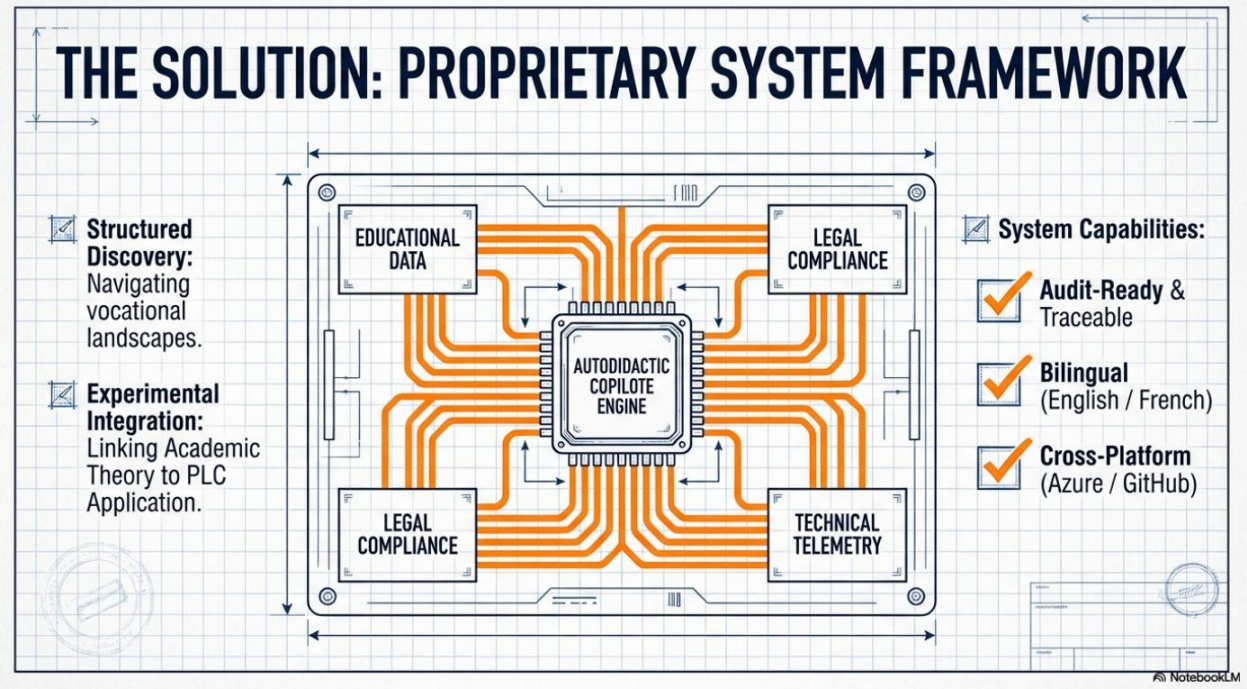

CROSS-SECTOR ADAPTABILITY: FINTECH
Digitizing Financial Compliance & Banking Operations
Universal Engine
VBA Core (`mLogiAlgo`)
ENGINEERING RULES
BANKING RULES
The VBA Core (`mLogiAlgo`) remains remains unchanged. Only the data sheets (`Nodes`, `Rules`) are swapped to pivot from Engineering to Finance.
• New Inputs Listed:
- Input: ATM Circuit Design
- Input: SARB (Reserve Bank) Compliance
- Input: Banknote Processing Specs

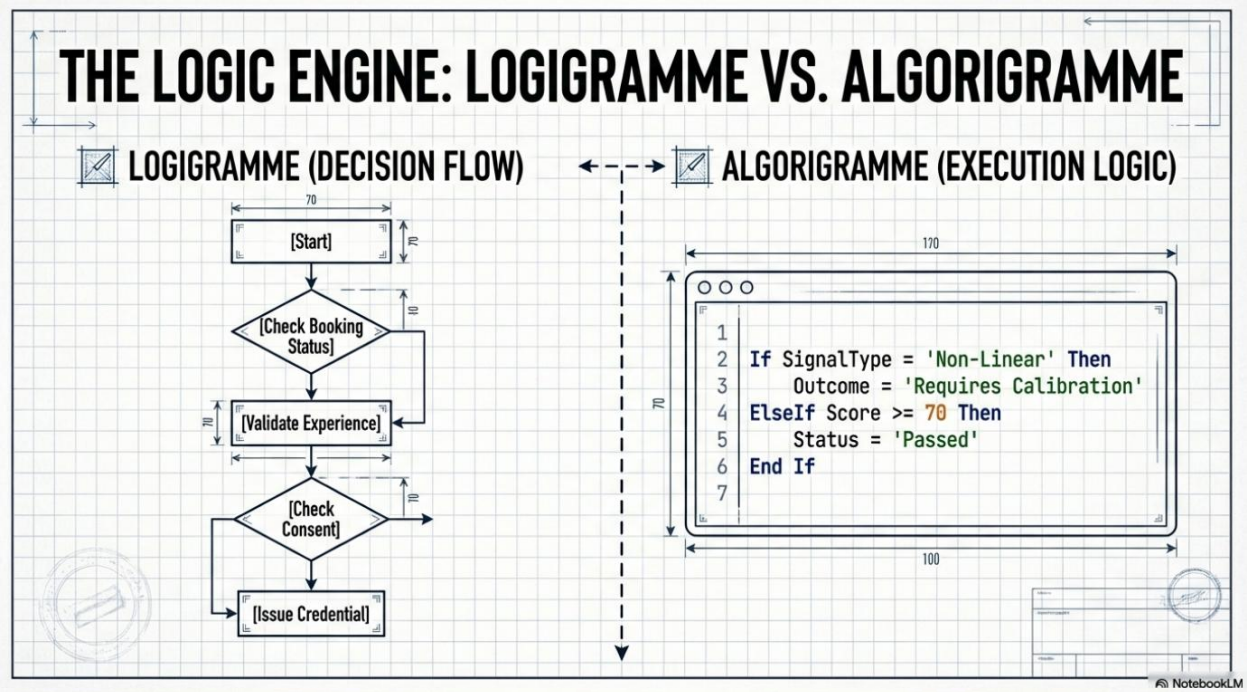

PROFESSIONAL ROADMAP & CERTIFICATION
KNOWLEDGE BASE TIMELINE
ONGOING
PHASE 1,
1. ENGINEERING
N-Level Engineering & Electrical Trade Theory
PHASE 2,
CERTIFIED
2. POLICING/SECURITY
Police Community Support
Security Ops
ONGOING
3. CYBERSECURITY
ISC2 Candidate (CC, SSCP)
Microsoft Security AI
ONGOING
4. DATA SCIENCE
Coursera & Microsoft Applied Skills
"Lifelong learning as the dataset for continuous innovation."

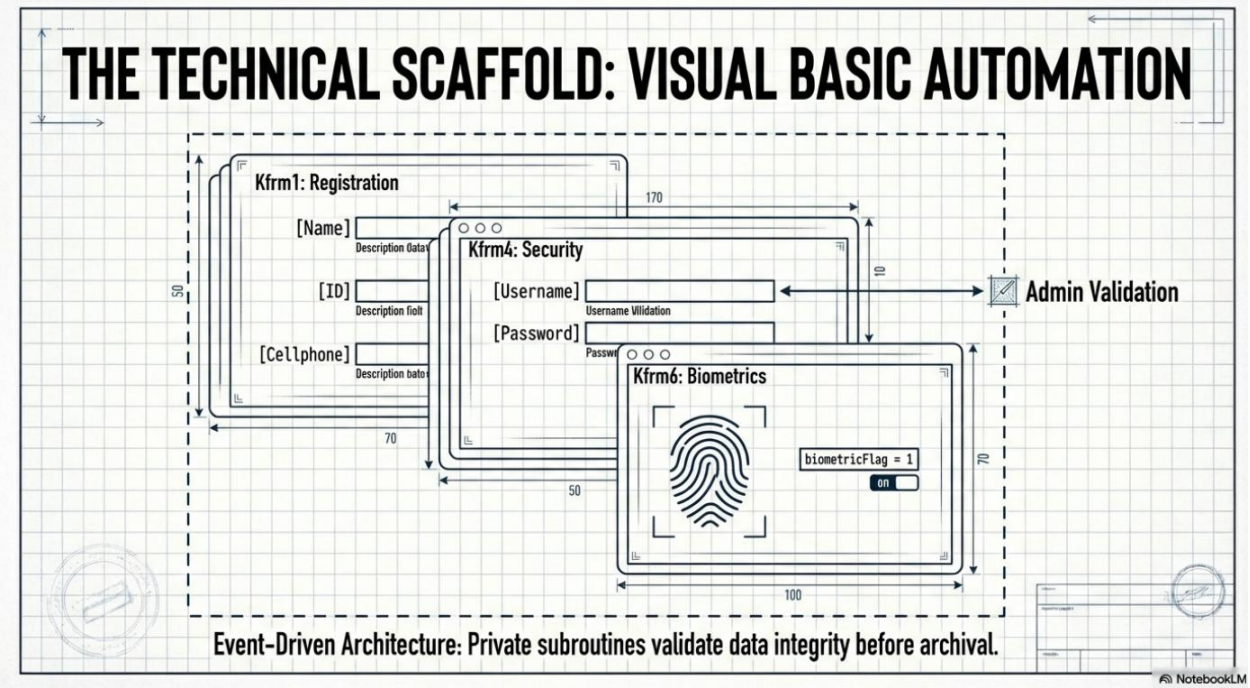
OPERATIONAL READINESS
✓ Hardware Specification Auditing (Engineering)
✓ Risk & Compliance Validation (Cyber/Policing)
✓ Curriculum & Career Management (Education)
THE LOGIGRAM ENGINE
READY FOR DEPLOYMENT.
Target Environments: SOCs, Engineering Design Firms, Educational Institutions
Author: Tshingombe | Portfolio: Integrated Competency Framework

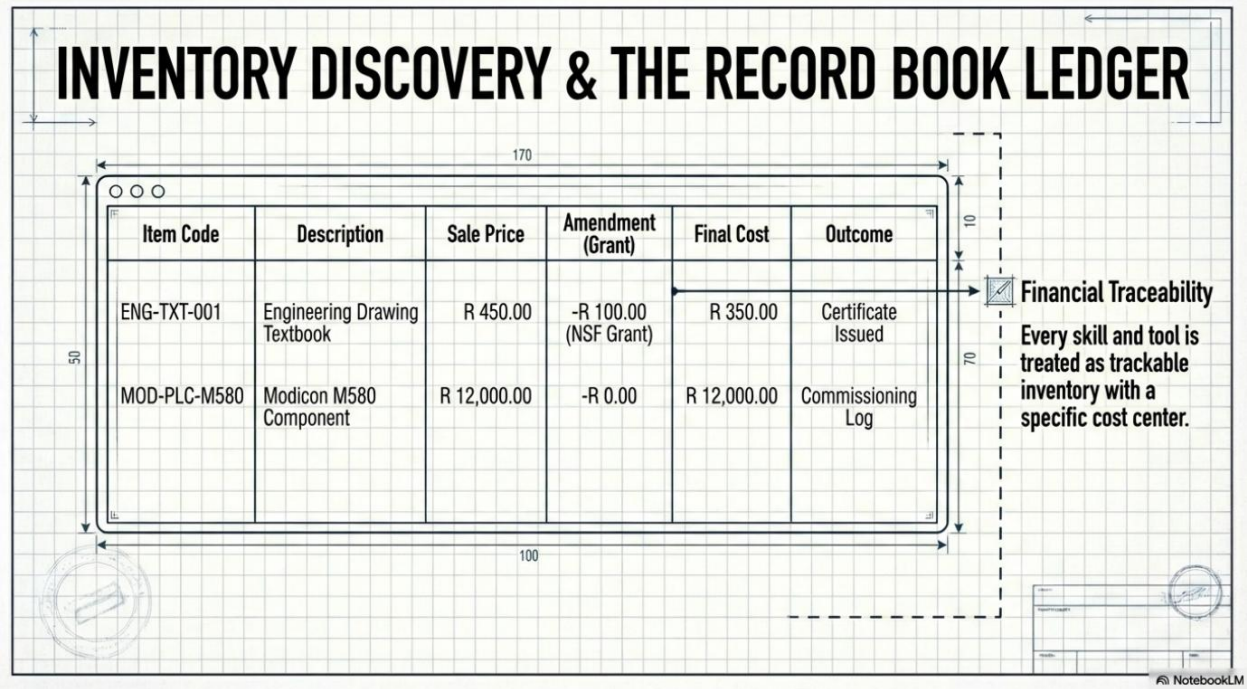

THE MODULAR CAREER & CURRICULUM INTEGRATION SYSTEM
A Unified Framework for Autodidactic Copilote Learning, Trade Discovery, and Audit-Ready Archival
ARCHITECT: Tshingombe Tshitadi Fiston
SYSTEM CORE
SOFTWARE ENGINEERING (VBA / BINARY LOGIC)
INDUSTRIAL CONTROL (PLC / SCADA)
THE UNIVERSAL LEDGER
EDUCATIONAL THEORY (ORTHOPEDAGOGY / TVET)
ARCHIVAL SCIENCE (TRACEABILITY / IP)
Radius
45°
25°

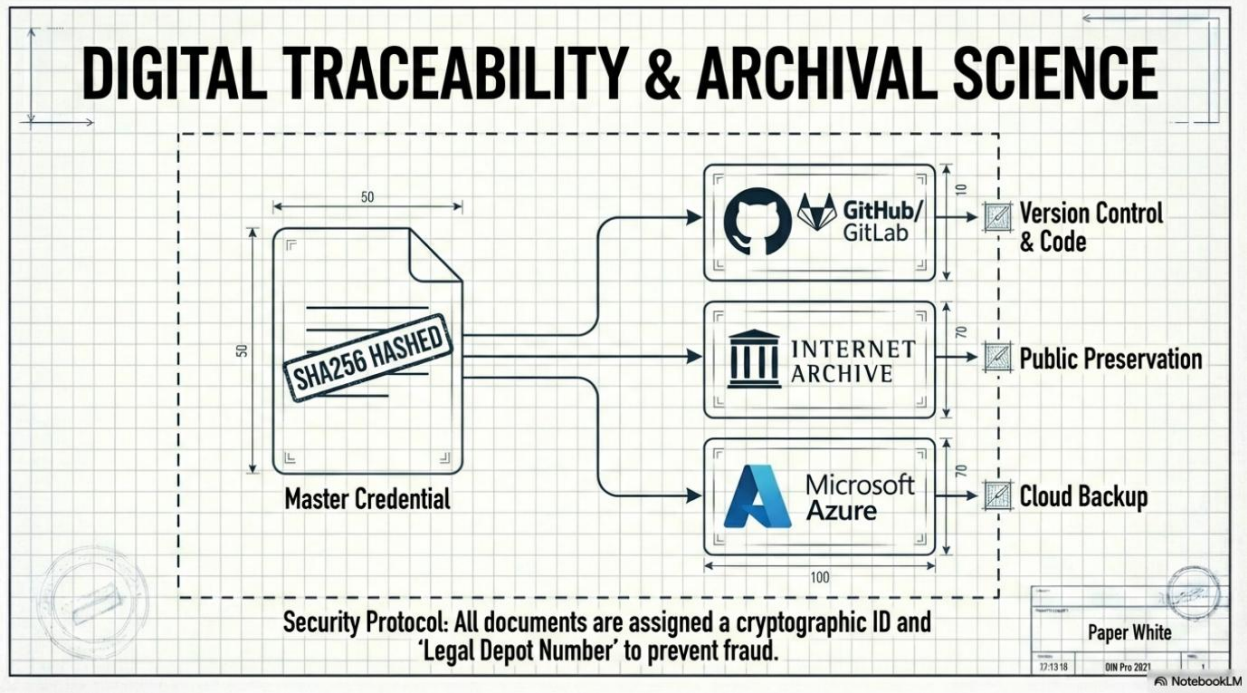

THE FRAGMENTATION PROBLEM
EDUCATIONAL DATA
SAQA/NQF Records
Transcripts
LEGAL COMPLIANCE
Affidavits
SAPS Clearance
IP Licenses
TECHNICAL TELEMETRY
PLC Logs
SCADA Signals
Variable X1~X7
COMPLIANCE RISK:
DATA SILOS & MANUAL ENTRY ERRORS
CONSEQUENCE: LACK OF A UNIVERSAL LEDGER RENDERS MULTIDISCIPLINARY VALIDATION IMPOSSIBLE
NotebookLM

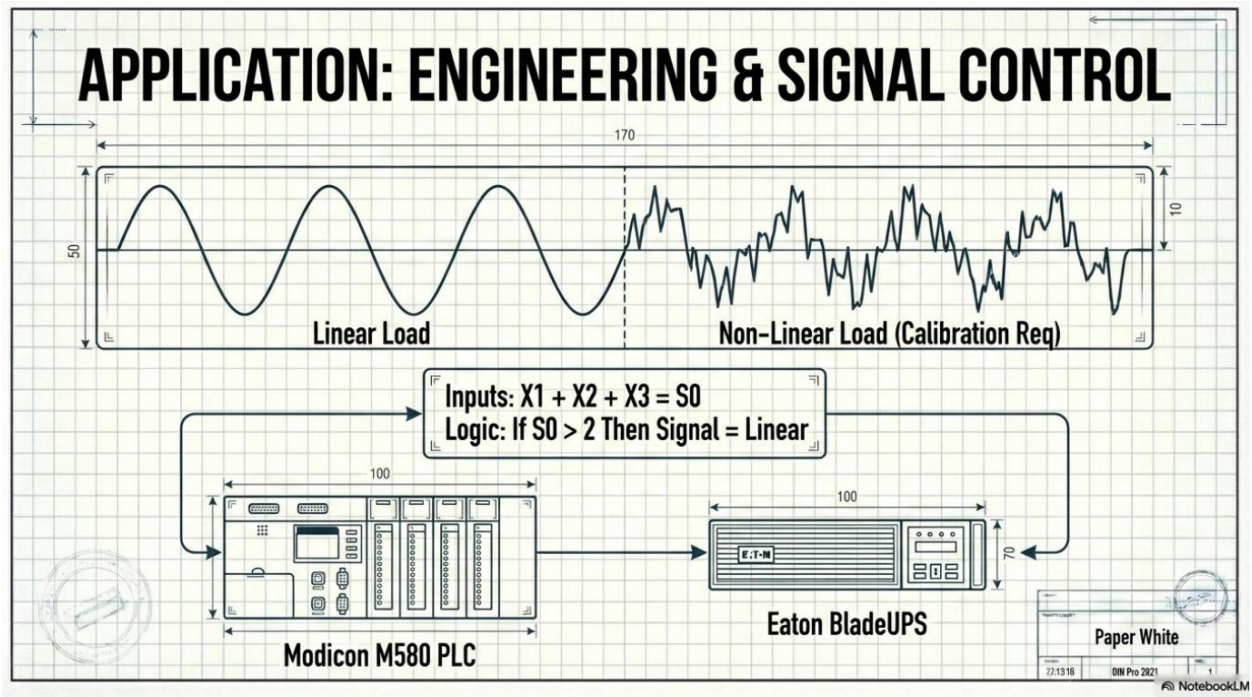

THE SOLUTION: PROPRIETARY SYSTEM FRAMEWORK
Structured Discovery: Navigating vocational landscapes.
Experimental Integration: Linking Academic Theory to PLC Application.
EDUCATIONAL DATA
LEGAL COMPLIANCE
AUTODIDACTIC COPILOTE ENGINE
LEGAL COMPLIANCE
TECHNICAL TELEMETRY
System Capabilities:
Audit-Ready & Traceable
Bilingual (English / French)
Cross-Platform (Azure / GitHub)
NotebookLM

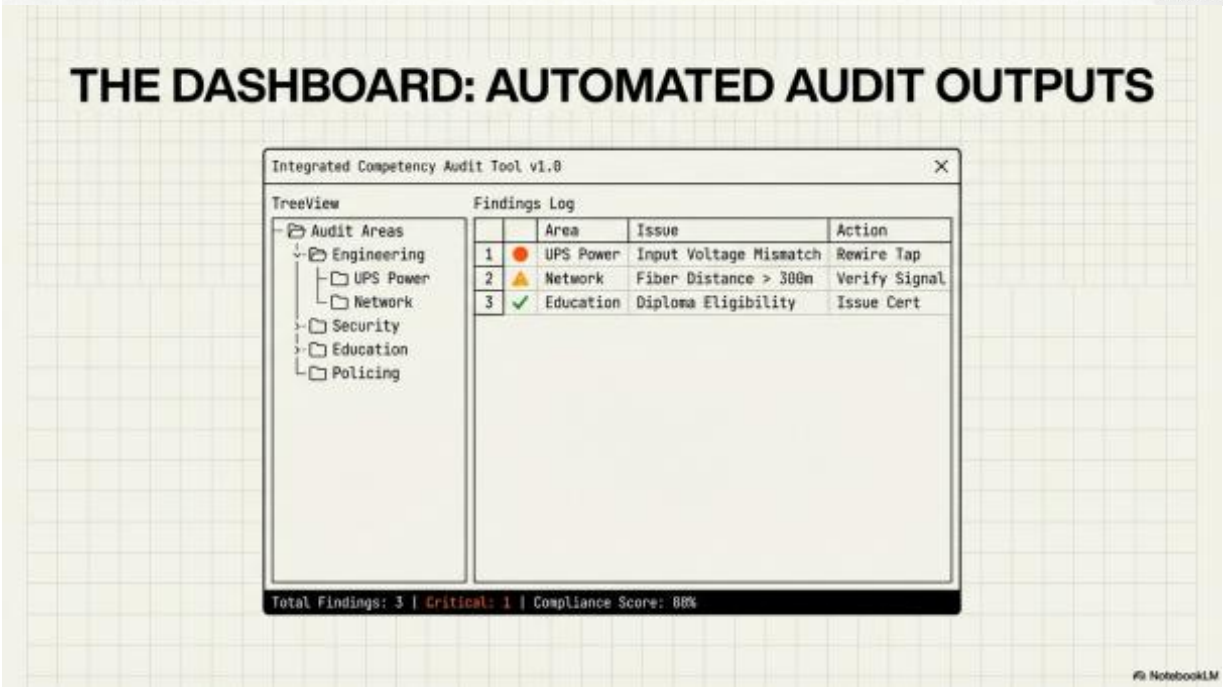

THE LOGIC ENGINE: LOGIGRAMME VS. ALGORIGRAMME
LOGIGRAMME (DECISION FLOW)
ALGORIGRAMME (EXECUTION LOGIC)
[Start]
[Check Booking Status]
[Validate Experience]
[Check Consent]
[Issue Credential]
If SignalType = 'Non-Linear' Then
Outcome = 'Requires Calibration'
ElseIf Score >= 70 Then
Status = 'Passed'
End If
NotebookLM

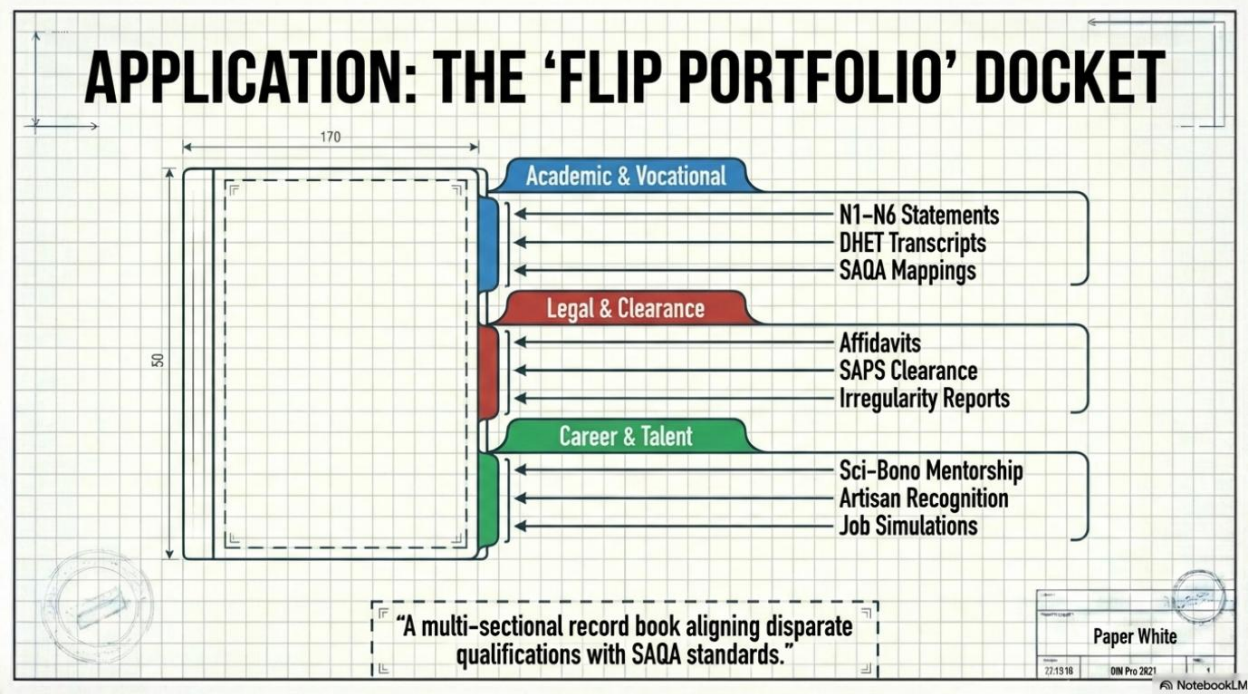

THE TECHNICAL SCAFFOLD: VISUAL BASIC AUTOMATION
Kfrm1: Registration
[Name]
[ID]
[Cellphone]
Kfrm4: Security
[Username]
[Password]
Admin Validation
Kfrm6: Biometrics
biometricFlag = 1
on
Event-Driven Architecture: Private subroutines validate data integrity before archival.
NotebookLM

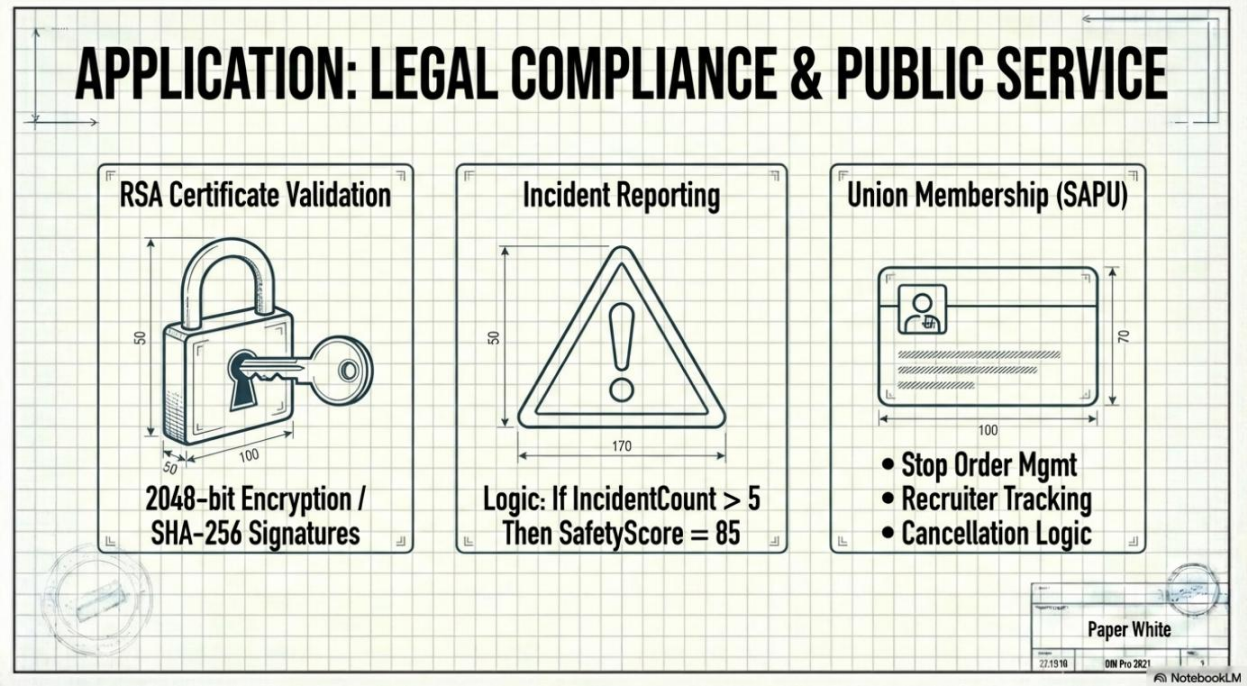

INVENTORY DISCOVERY & THE RECORD BOOK LEDGER
170
50
100
10
70
Item Code
Description
Sale Price
Amendment (Grant)
Final Cost
Outcome
ENG-TXT-001
Engineering Drawing Textbook
R 450.00
-R 100.00 (NSF Grant)
R 350.00
Certificate Issued
MOD-PLC-M580
Modicon M580 Component
R 12,000.00
-R 0.00
R 12,000.00
Commissioning Log
Financial Traceability
Every skill and tool is treated as trackable inventory with a specific cost center.
NotebookLM

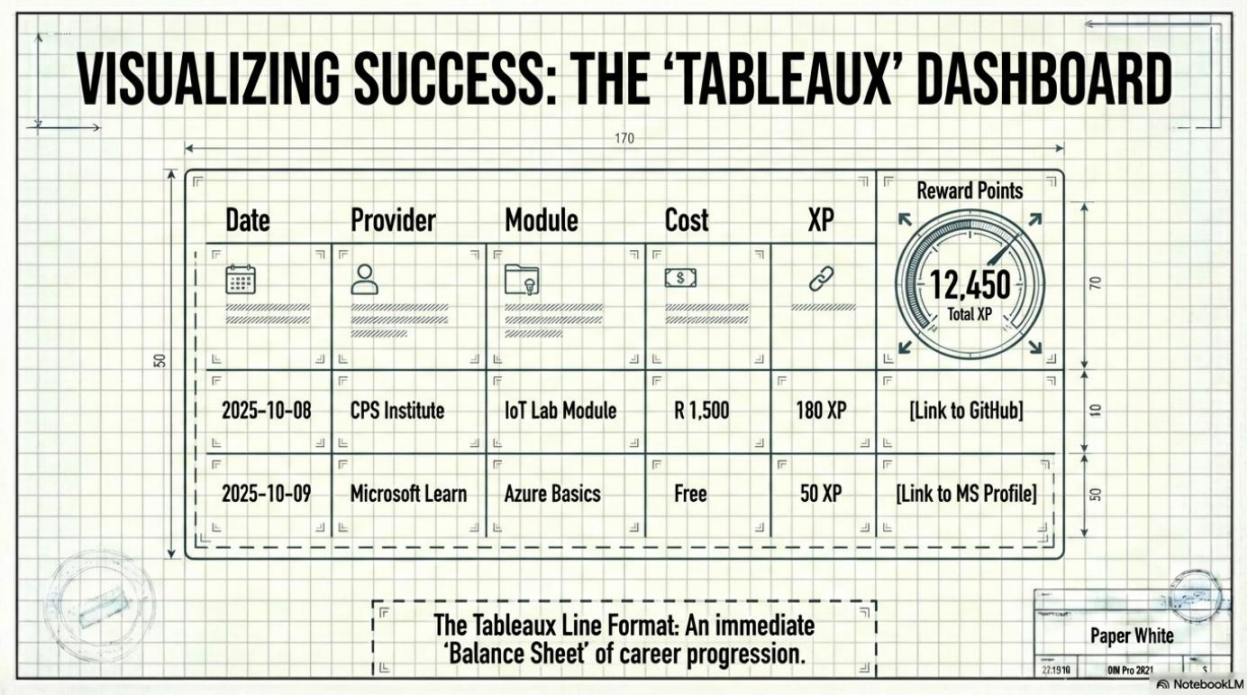

DIGITAL TRACEABILITY & ARCHIVAL SCIENCE
50
50
SHA256 HASHED
Master Credential
GitHub/ GitLab
Version Control & Code
INTERNET ARCHIVE
Public Preservation
Microsoft Azure
Cloud Backup
10
70
70
100
Security Protocol: All documents are assigned a cryptographic ID and 'Legal Depot Number' to prevent fraud.
Paper White
NotebookLM

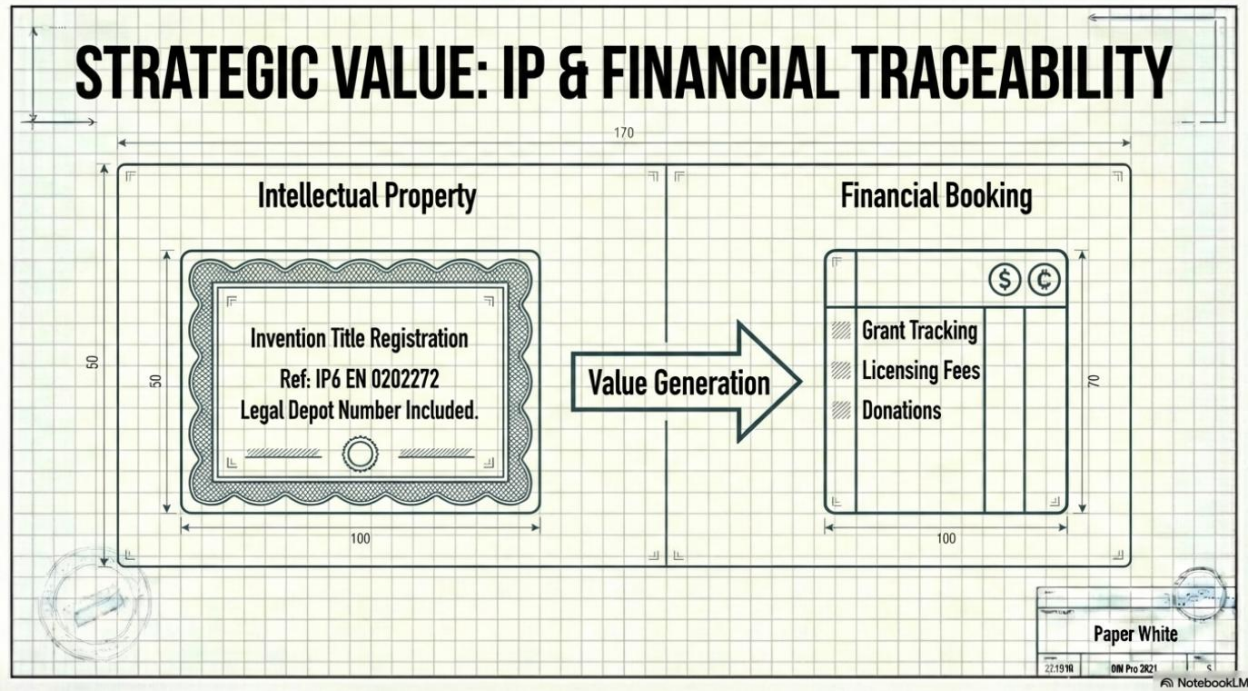

APPLICATION: ENGINEERING & SIGNAL CONTROL
170
50
10
Linear Load
Non-Linear Load (Calibration Req)
Inputs: X1 + X2 + X3 = S0
Logic: If S0 > 2 Then Signal = Linear
100
100
70
Modicon M580 PLC
Eaton BladeUPS
Paper White
NotebookLM

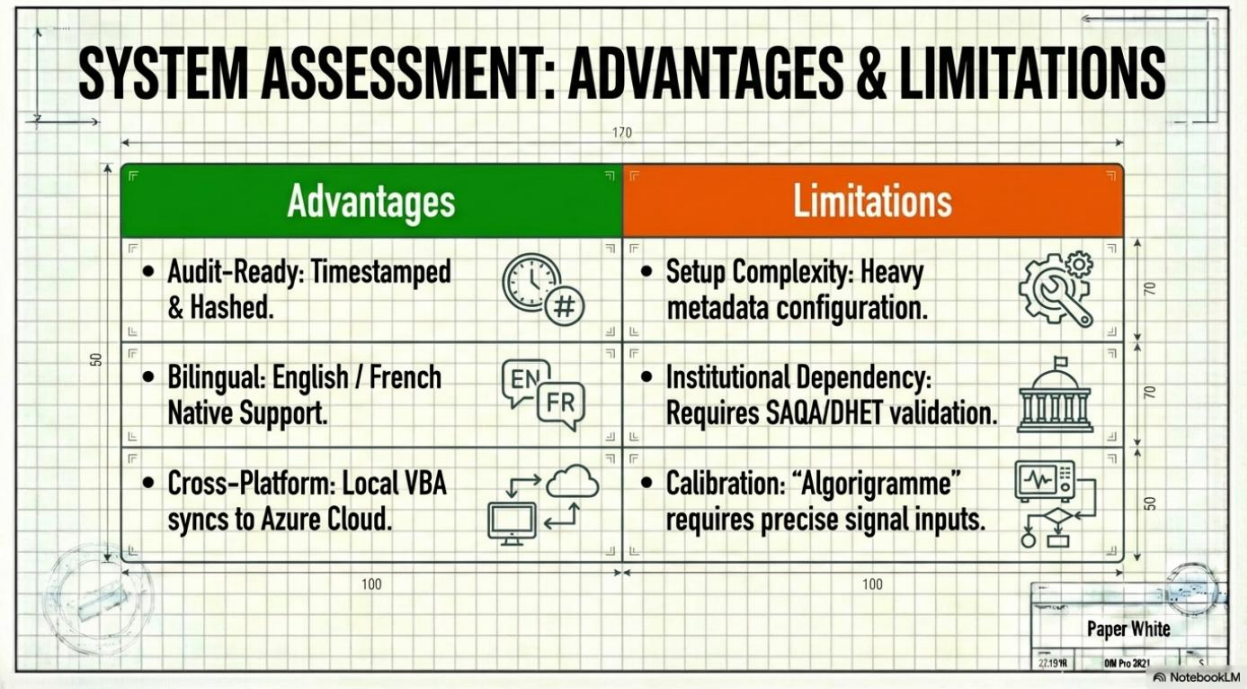

THE DASHBOARD: AUTOMATED AUDIT OUTPUTS
Integrated Competency Audit Tool v1.0
TreeView
Audit Areas
Engineering
UPS Power
Network
Security
Education
Policing
Findings Log
Area
Issue
Action
1
UPS Power
Input Voltage Mismatch
Rewire Tap
2
Network
Fiber Distance > 300m
Verify Signal
3
Education
Diploma Eligibility
Issue Cert
Total Findings: 3 | Critical: 1 | Compliance Score: 80%
NotebookLM

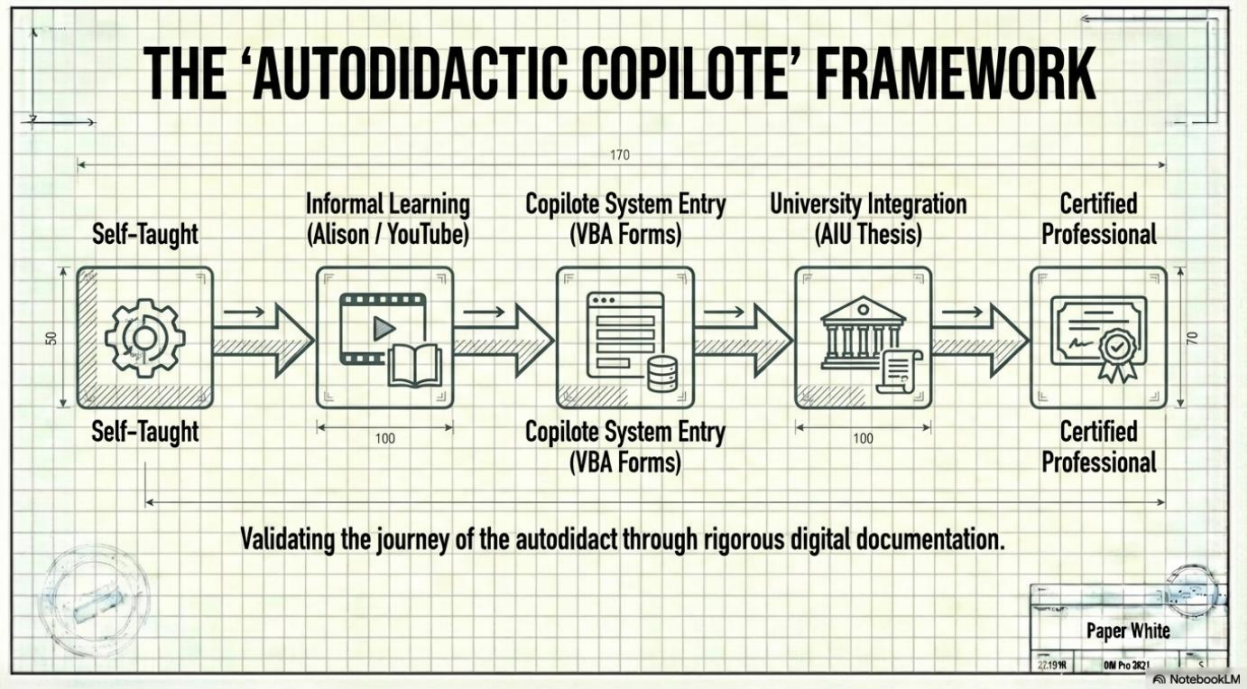

APPLICATION: THE 'FLIP PORTFOLIO' DOCKET
170
50
Academic & Vocational
N1–N6 Statements
DHET Transcripts
SAQA Mappings
Legal & Clearance
Affidavits
SAPS Clearance
Irregularity Reports
Career & Talent
Sci-Bono Mentorship
Artisan Recognition
Job Simulations
"A multi-sectional record book aligning disparate qualifications with SAQA standards."
Paper White
NotebookLM

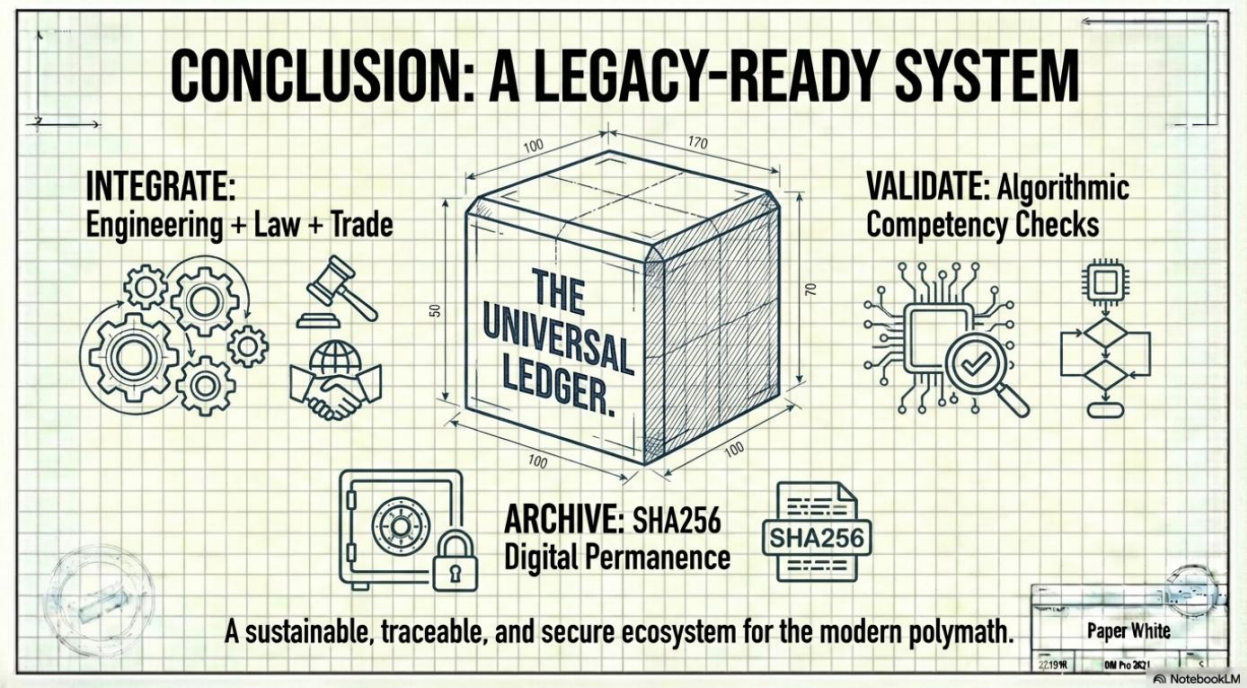

APPLICATION: LEGAL COMPLIANCE & PUBLIC SERVICE
RSA Certificate Validation
50
100
50
2048-bit Encryption / SHA-256 Signatures
Incident Reporting
50
170
Logic: If IncidentCount > 5 Then SafetyScore = 85
Union Membership (SAPU)
70
100
• Stop Order Mgmt
• Recruiter Tracking
• Cancellation Logic
Paper White
NotebookLM


VISUALIZING SUCCESS: THE 'TABLEAUX' DASHBOARD
Date
Provider
Module
Cost
XP
Reward Points
12,450
Total XP
2025-10-08
CPS Institute
IoT Lab Module
R 1,500
180 XP
[Link to GitHub]
2025-10-09
Microsoft Learn
Azure Basics
Free
50 XP
[Link to MS Profile]
The Tableaux Line Format: An immediate 'Balance Sheet' of career progression.
Paper White
NotebookLM


STRATEGIC VALUE: IP & FINANCIAL TRACEABILITY
Intellectual Property
Invention Title Registration
Ref: IP6 EN 0202272
Legal Depot Number Included.
Value Generation
Financial Booking
Grant Tracking
Licensing Fees
Donations
Paper White
NotebookLM

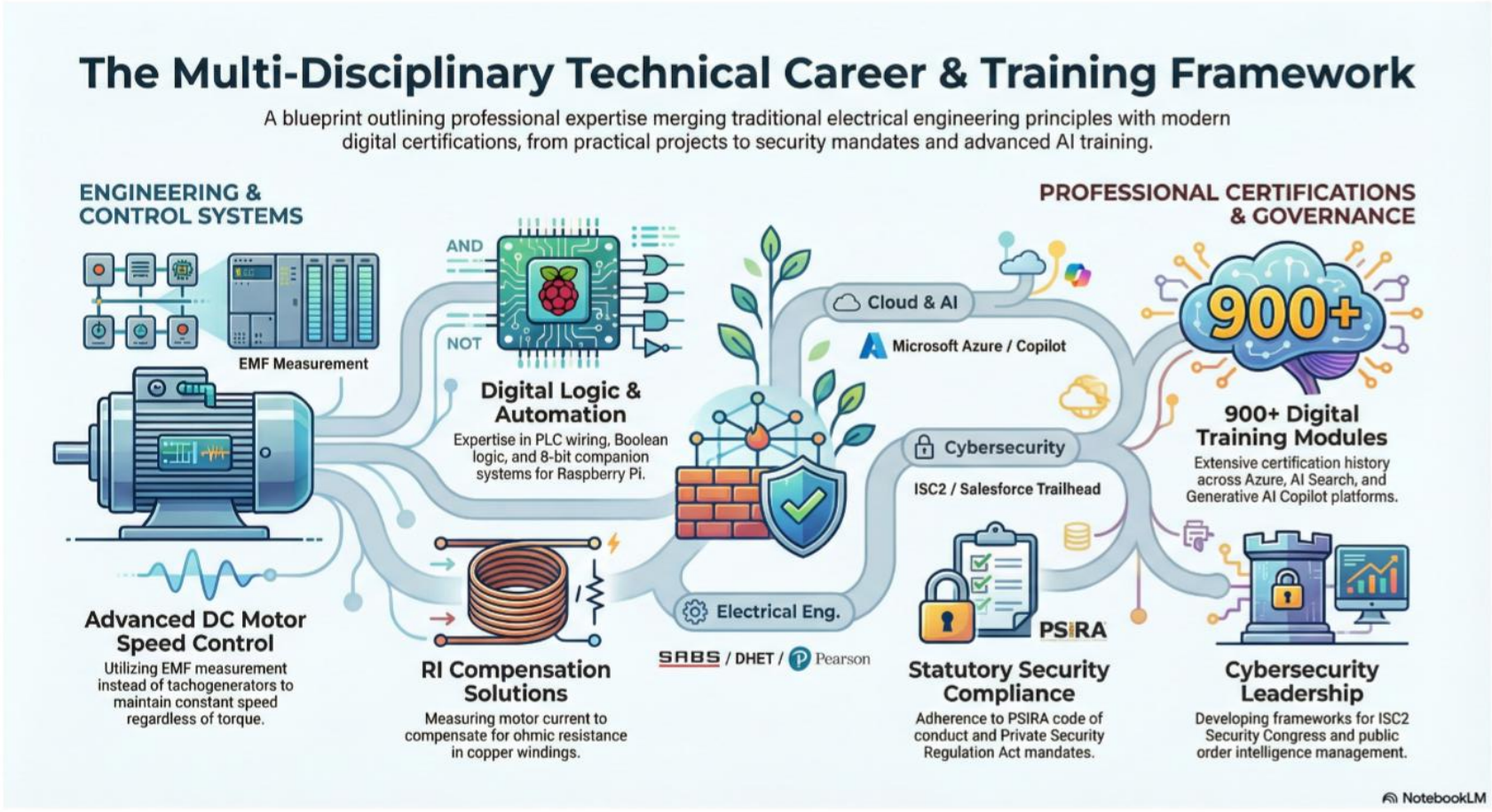

SYSTEM ASSESSMENT: ADVANTAGES & LIMITATIONS
170
Advantages
Limitations
• Audit-Ready: Timestamped & Hashed.
• Setup Complexity: Heavy metadata configuration.
• Bilingual: English / French Native Support.
EN
FR
• Institutional Dependency: Requires SAQA/DHET validation.
• Cross-Platform: Local VBA syncs to Azure Cloud.
• Calibration: "Algorigramme" requires precise signal inputs.
50
70
70
50
100
100
Paper White
NotebookLM

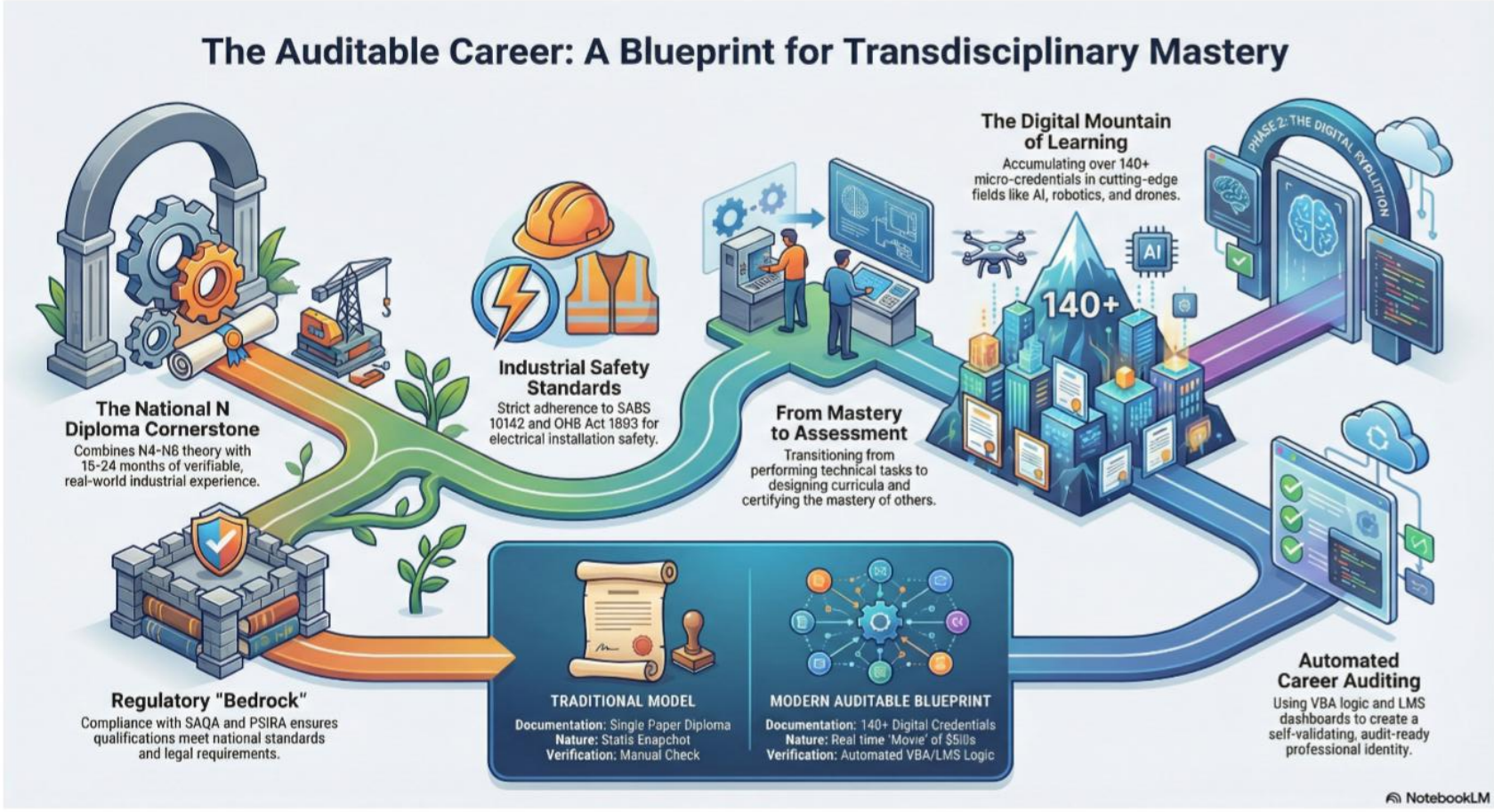

THE 'AUTODIDACTIC COPILOTE' FRAMEWORK
170
Self-Taught
Informal Learning (Alison / YouTube)
Copilote System Entry (VBA Forms)
University Integration (AIU Thesis)
Certified Professional
50
70
100
100
Self-Taught
Copilote System Entry (VBA Forms)
Certified Professional
Validating the journey of the autodidact through rigorous digital documentation.
Paper White
NotebookLM


CONCLUSION: A LEGACY-READY SYSTEM
INTEGRATE:
Engineering + Law + Trade
100
170
50
70
THE UNIVERSAL LEDGER.
100
100
VALIDATE: Algorithmic Competency Checks
ARCHIVE: SHA256
Digital Permanence
SHA256
A sustainable, traceable, and secure ecosystem for the modern polymath.
Paper White
NotebookLM

The Multi-Disciplinary Technical Career & Training Framework

A blueprint outlining professional expertise merging traditional electrical engineering principles with modern digital certifications, from practical projects to security mandates and advanced AI training.


ENGINEERING & CONTROL SYSTEMS
PROFESSIONAL CERTIFICATIONS & GOVERNANCE
AND
NOT
EMF Measurement
Digital Logic & Automation
Expertise in PLC wiring, Boolean logic, and 8-bit companion systems for Raspberry Pi.
Cloud & AI
Microsoft Azure / Copilot
900+
900+ Digital Training Modules
Extensive certification history across Azure, AI Search, and Generative AI Copilot platforms.
Cybersecurity
ISC2 / Salesforce Trailhead
Electrical Eng.
SABS / DHET / Pearson
PSIRA
Advanced DC Motor Speed Control
Utilizing EMF measurement instead of tachogenerators to maintain constant speed regardless of torque.
RI Compensation Solutions
Measuring motor current to compensate for ohmic resistance in copper windings.
Statutory Security Compliance
Adherence to PSIRA code of conduct and Private Security Regulation Act mandates.
Cybersecurity Leadership
Developing frameworks for ISC2 Security Congress and public order intelligence management.
NotebookLM


The Auditable Career: A Blueprint for Transdisciplinary Mastery
The National N Diploma Cornerstone
Combines N4-N6 theory with 15-24 months of verifiable, real-world industrial experience.
Industrial Safety Standards
Strict adherence to SABS 10142 and OHB Act 1893 for electrical installation safety.
From Mastery to Assessment
Transitioning from performing technical tasks to designing curricula and certifying the mastery of others.
The Digital Mountain of Learning
Accumulating over 140+ micro-credentials in cutting-edge fields like AI, robotics, and drones.
140+
AI
PHASE 2: THE DIGITAL EVOLUTION
Regulatory "Bedrock"
Compliance with SAQA and PSIRA ensures qualifications meet national standards and legal requirements.
TRADITIONAL MODEL
Documentation: Single Paper Diploma
Nature: Static Snapshot
Verification: Manual Check
MODERN AUDITABLE BLUEPRINT
Documentation: 140+ Digital Credentials
Nature: Real time 'Movie' of Skills
Verification: Automated VBA/LMS Logic
Automated Career Auditing
Using VBA logic and LMS dashboards to create a self-validating, audit-ready professional identity.
NotebookLM

ST PRACE COLLEGE
EST. 20XX

Professional Qualification & Assessment Roadmap:

Tshingombe Tshitadi

Role: Engineering Student & Assessment Moderator

PROFESSIONAL IDENTITY & CORE CREDENTIALS

Profile: Engineering Student & Assessment Moderator

Holds SAQA Asset ID 09121 and is registered under Institutional Code 30_39.

NQF LEVEL 6 QUALIFICATION PATHWAY

Pursuing the National N Diploma in Engineering (SAQA ID 90674) requiring 360 total credits.

DIVERSE PROFESSIONAL CERTIFICATIONS

- Alison Diplomas in Applied Psychology and Outcome-based Education
- Trailhead Expeditioner Rank

ENGINEERING ASSESSMENT STANDARDS

ICASS TRIMESTER WEIGHTING

Trimester marks are calculated as Test 1 (30%) and Test 2 (70%).

ELECTRICAL TRADE THEORY FOCUS

- **DC Theory** (30%)
- **Wiring of Premises** (25%)
- **Safety** (10%)

REGULATORY COMPLIANCE STANDARDS

All work adheres to SANS 10142-1, IEC symbols, and SI measurement standards.

NATED N4–N6 ENGINEERING SUBJECT PROGRESSION

N4 CERTIFICATE
Mathematics
Engineering Science
Industrial Electronics

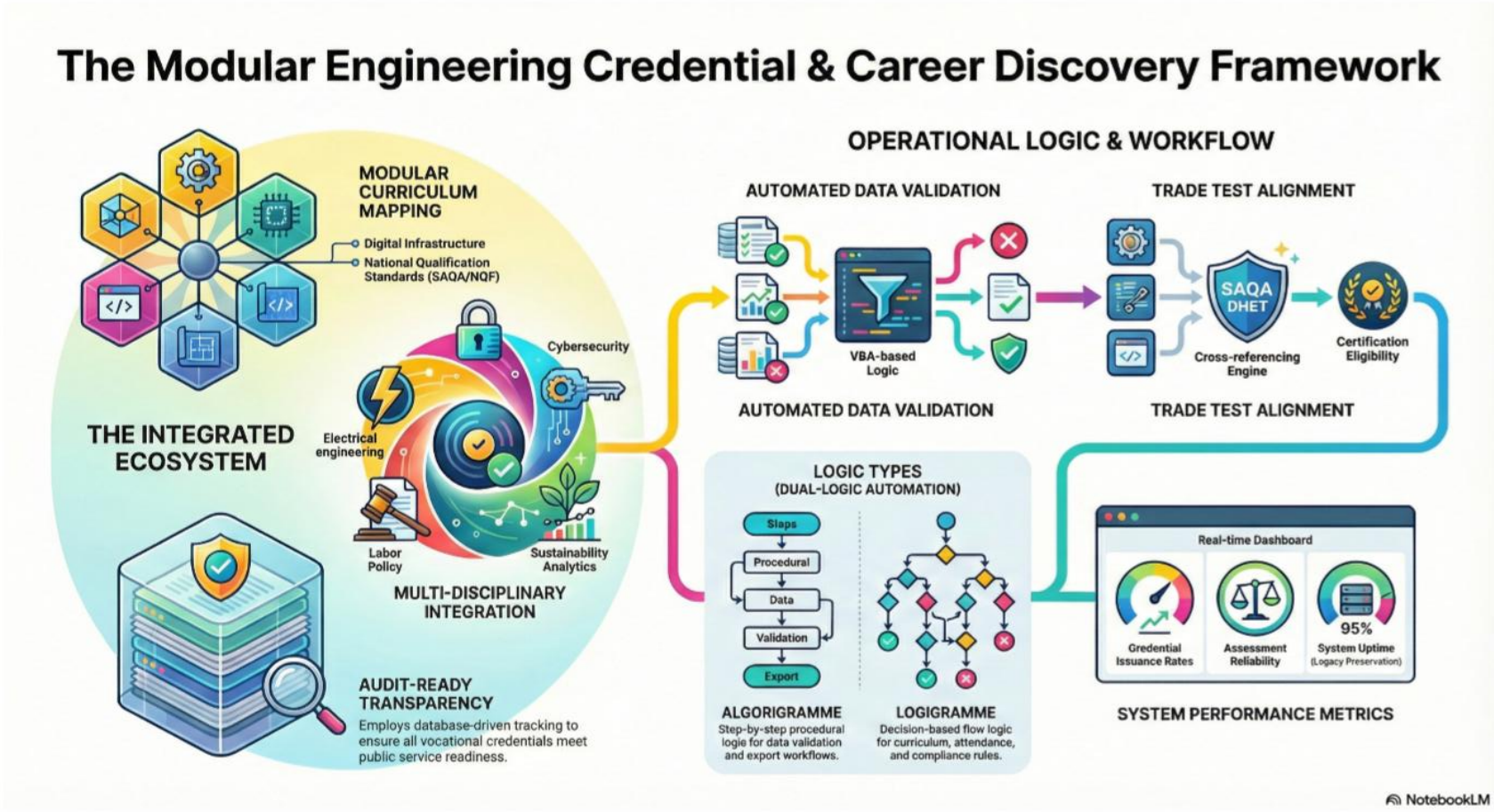
N5 CERTIFICATE
Electro-technics
Digital Electronics
Power Machines

N6 CERTIFICATE
Control Systems
Installation Rules
Specialized Electric Codes

ZA-STP-2024-09121-T

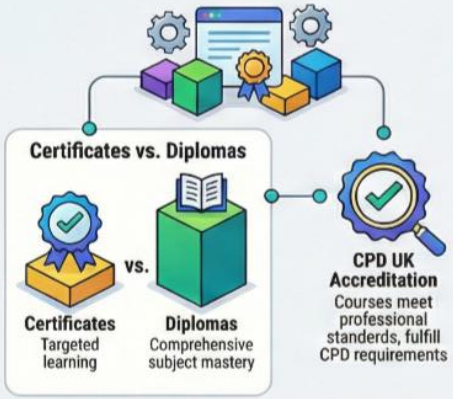
SECURE DIGITAL TRANSMISSION • SECURE DIGITAL TEACHIMWAY

NotebookLM


The Modular Engineering Credential & Career Discovery Framework
THE INTEGRATED ECOSYSTEM
MODULAR CURRICULUM MAPPING
Digital Infrastructure
National Qualification Standards (SAQA/NQF)
Cybersecurity
Electrical engineering
Labor Policy
Sustainability Analytics
MULTI-DISCIPLINARY INTEGRATION
AUDIT-READY TRANSPARENCY
Employs database-driven tracking to ensure all vocational credentials meet public service readiness.
OPERATIONAL LOGIC & WORKFLOW
AUTOMATED DATA VALIDATION
VBA-based Logic
AUTOMATED DATA VALIDATION
TRADE TEST ALIGNMENT
SAQA DHET
Cross-referencing Engine
Certification Eligibility
TRADE TEST ALIGNMENT
LOGIC TYPES (DUAL-LOGIC AUTOMATION)
Steps
Procedural
Data
Validation
Export
ALGORIGRAMME
Step-by-step procedural logic for data validation and export workflows.
LOGIGRAMME
Decision-based flow logic for curriculum, attendance, and compliance rules.
Real-time Dashboard
Credential Issuance Rates
Assessment Reliability
95%
System Uptime
(Legacy Preservation)
SYSTEM PERFORMANCE METRICS
NotebookLM

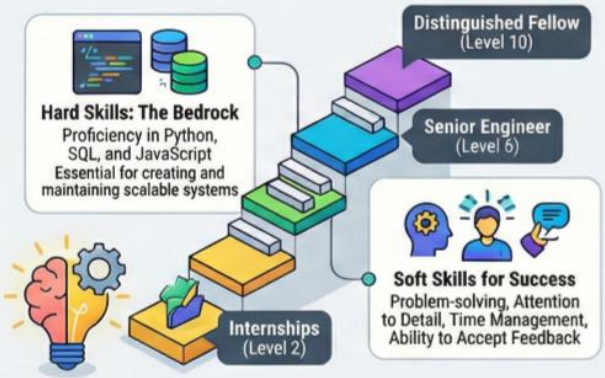
Your Blueprint for Career Advancement: Mastering Skills through Online Learning

Navigating Online Certifications



The 80% Mastery Rule
Complete all modules, achieve at least 80% on assessments to pass

The 10-Level Career Ladder


Hard Skills: The Bedrock
Proficiency in Python, SQL, and JavaScript
Essential for creating and maintaining scalable systems
Distinguished Fellow (Level 10)
Senior Engineer (Level 6)
Soft Skills for Success
Problem-solving, Attention to Detail, Time Management, Ability to Accept Feedback
Internships (Level 2)

Program Duration & Focus Area Comparison

Program Type	Estimated Duration	Focus Area
Certificate Course	2–3 Hours	Specific topics (e.g., Languages, Programming)
Diploma Course	6–15 Hours	Comprehensive understanding (e.g., Management)
Engineering Trade	1 Trimester	Theoretical knowledge for apprenticeships

Strategic Job Hunting & Networking

Online vs. Real-Life Networking

Online Presence (GitHub/Linkedin)
Vital for visibility

Face-to-Face Meetups & Conferences
Higher-quality connections

Build a High-Impact Portfolio
Showcase projects using external APIs or real-time messaging

The 7-Second Resume Rule
One page, concise, action-oriented language; recruiters skim quickly

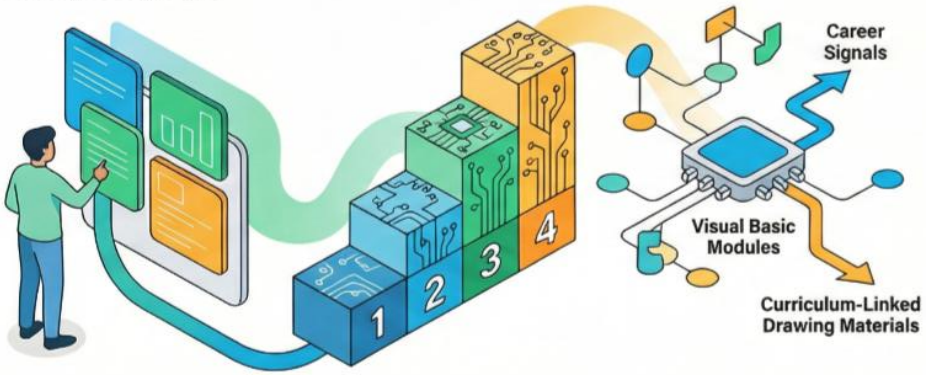
NotebookLM

The Credential-Linked Engineering Career Framework

Synthesizes didactic "autopedagogie" with industrial technical standards, bridging classroom theory and workplace deployment using psychometric data and automated logigrams for technical job readiness.

Integrated Educational Methodology

Didactic Autopedagogie

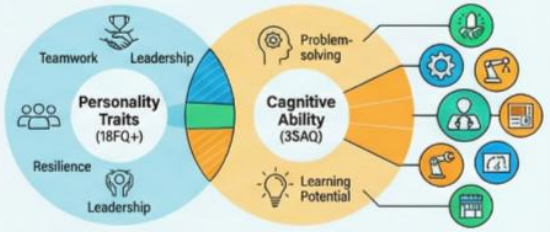


Didactic Autopedagogie
A self-directed learning methodology using modular panels to build embodied engineering knowledge

4 Levels of Competence
Learners are classified from Level 1 to 4 based on IRT-calibrated circuit analysis tasks

Logigram Automation
Visual Basic modules automate the routing of career signals and curriculum-linked drawing materials.

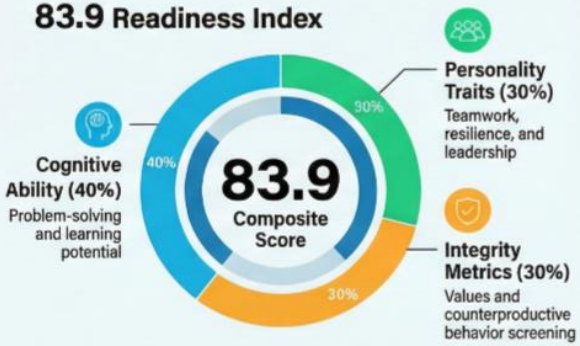
Data-Driven Career Readiness



Psychometric Profiling

Mapping personality (18FQ+) and cognitive (3SAQ) traits to specific industrial job roles

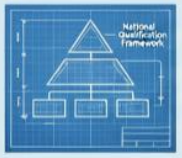
83.9 Readiness Index



NotebookLM

The Unified Technical & Vocational Ecosystem: From Curriculum to Career

Phase 1: The Foundation of Standards and Discovery



SAQA/NQF Curriculum Mapping

Aligning engineering diagnostics with national qualification frameworks to ensure professional credential visibility.

Portfolio-Based Integration

Transforming technical schematics, fault logs, and compliance checklists into a portable, professional evidence-based career portfolio.

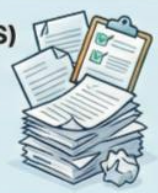
Holistic Career Discovery

Utilizing psychometric assessments to map individual aptitudes to Realistic, investigative, Artistic, or Social vocational roles.

Phase 2: Technical Execution and Performance

Digital Governance (CMS)

Replacing manual, paper-based records with web-based Crime Management Systems to enhance accessibility and data security.



Availability

Operating Time / Load Time
> 90% TARGET

Quality Rate

Good Units / Total Units
> 98% TARGET

OEE Performance Metrics

Measuring industrial success through Overall Equipment Effectiveness: Availability × Performance × Quality.

OEE Index

Availability × Performance × Quality
INDUSTRIAL OPTIMIZATION

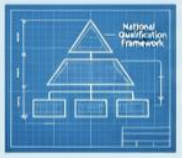
4IR Technology Integration

Embedding AI, IoT, and Robotic Process Automation (RPA) into traditional electrical and electrochemical engineering workflows.

NotebookLM

The Unified Technical & Vocational Ecosystem: From Curriculum to Career

Phase 1: The Foundation of Standards and Discovery



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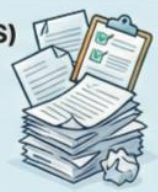

Availability

Operating Time / Load Time
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Quality Rate

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OEE Index

Availability × Performance × Quality
INDUSTRIAL OPTIMIZATION

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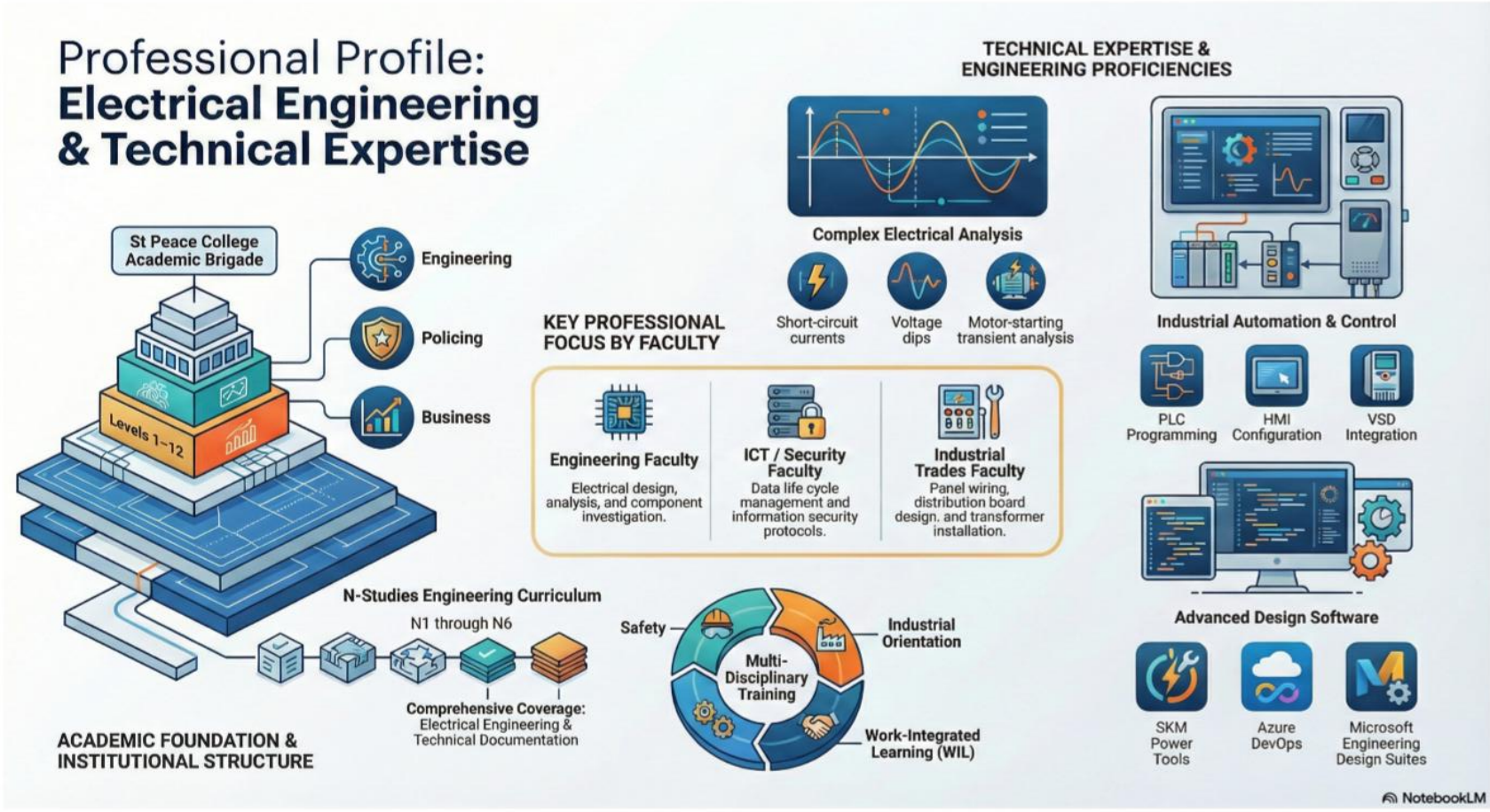
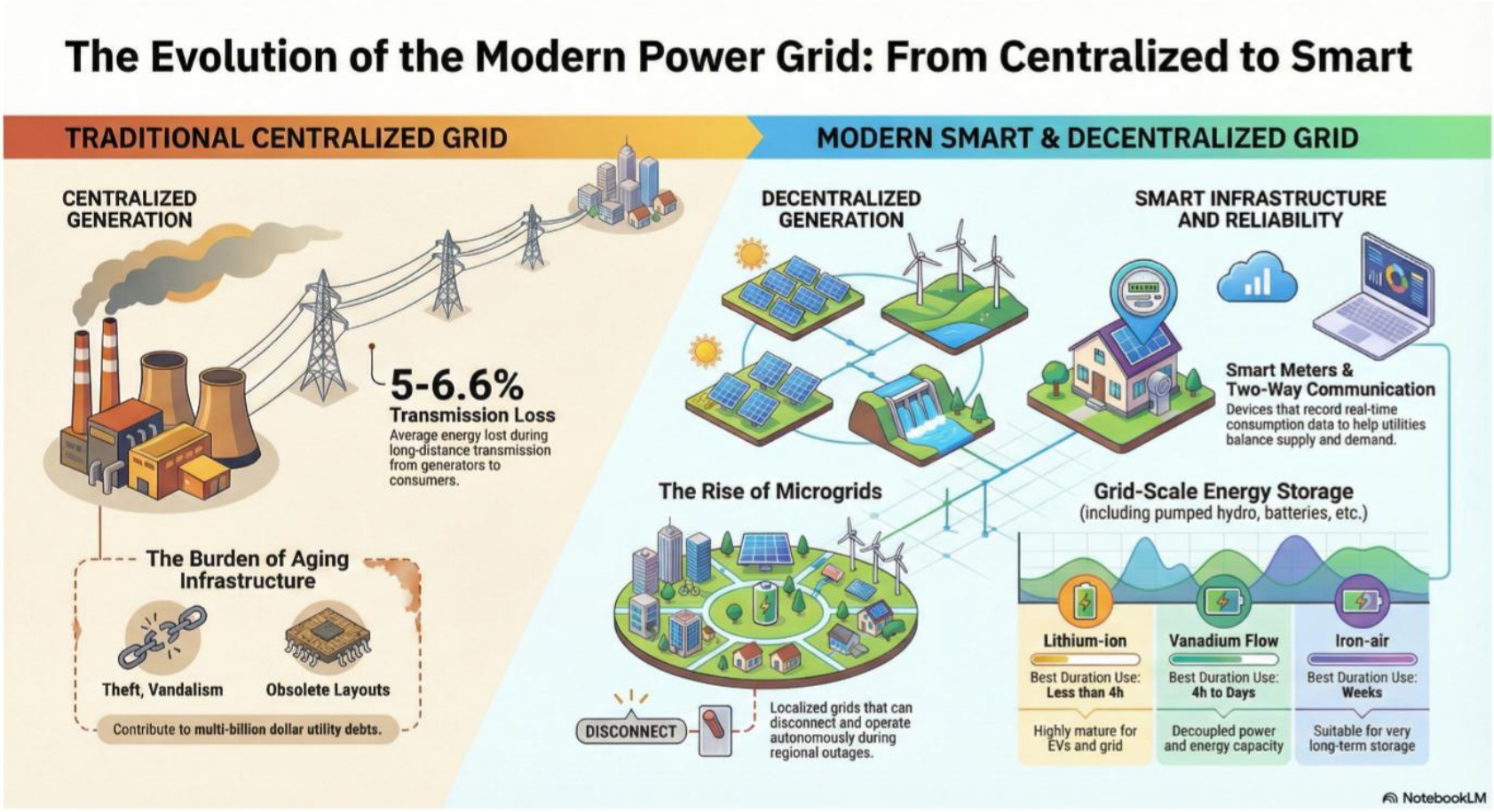
NotebookLM


Professional Profile:
Electrical Engineering
& Technical Expertise
TECHNICAL EXPERTISE &
ENGINEERING PROFICIENCIES
Complex Electrical Analysis
Short-circuit currents
Voltage dips
Motor-starting transient analysis
Industrial Automation & Control
PLC Programming
HMI Configuration
VSD Integration
Advanced Design Software
SKM Power Tools
Azure DevOps
Microsoft Engineering Design Suites
KEY PROFESSIONAL FOCUS BY FACULTY
Engineering Faculty
Electrical design, analysis, and component investigation.
ICT / Security Faculty
Data life cycle management and information security protocols.
Industrial Trades Faculty
Panel wiring, distribution board design, and transformer installation.
St Peace College
Academic Brigade
Engineering
Policing
Business
Levels 1-12
N-Studies Engineering Curriculum
N1 through N6
Comprehensive Coverage:
Electrical Engineering &
Technical Documentation
ACADEMIC FOUNDATION &
INSTITUTIONAL STRUCTURE
Safety
Industrial Orientation
Multi-Disciplinary Training
Work-Integrated Learning (WIL)
NotebookLM


The Evolution of the Modern Power Grid: From Centralized to Smart
TRADITIONAL CENTRALIZED GRID
MODERN SMART & DECENTRALIZED GRID
CENTRALIZED GENERATION
5-6.6%
Transmission Loss
Average energy lost during long-distance transmission from generators to consumers.
The Burden of Aging Infrastructure
Theft, Vandalism
Obsolete Layouts
Contribute to multi-billion dollar utility debts.
DECENTRALIZED GENERATION
SMART INFRASTRUCTURE AND RELIABILITY
Smart Meters & Two-Way Communication
Devices that record real-time consumption data to help utilities balance supply and demand.
The Rise of Microgrids
DISCONNECT
Localized grids that can disconnect and operate autonomously during regional outages.
Grid-Scale Energy Storage
(including pumped hydro, batteries, etc.)
Lithium-ion
Best Duration Use: Less than 4h
Highly mature for EVs and grid
Vanadium Flow
Best Duration Use: 4h to Days
Decoupled power and energy capacity
Iron-air
Best Duration Use: Weeks
Suitable for very long-term storage
NotebookLM

The Multidisciplinary Technical Framework: Engineering, Security, and ICT

This blueprint synthesizes an extensive portfolio of technical expertise, ranging from high-voltage electrical infrastructure and security service regulation to advanced cloud computing and AI. It highlights the intersection of vocational education, industrial practice, and digital certification.

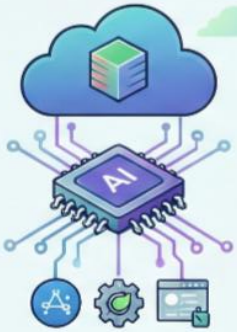
INDUSTRIAL ENGINEERING & SECURITY INFRASTRUCTURE

Electrical & Power Systems Management

Expertise in MV/LV substation design, transformer operations, and motor speed control via EMF measurement.

Security Technology & Statutory Compliance

Integration of access control, alarm systems, and adherence to the Private Security Industry Regulation Act.

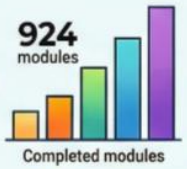


Vocational & NQF Curriculum Design

Development of technical trade frameworks for Nated N1-N6 levels and SAQA accredited programs.

DIGITAL EXPERTISE & EDUCATIONAL FRAMEWORK

738+
Training Hours in Digital Systems



Azure AI

Cloud architecture

Microsoft 365 ecosystem

Manufacturing & Industrial Flow

Oversight of manufacturing processes including sheet metal work, welding, and quality control statistical charts.

Engineering
Key Technical Focus: Substations & Electrotechnology
Certification / Framework:

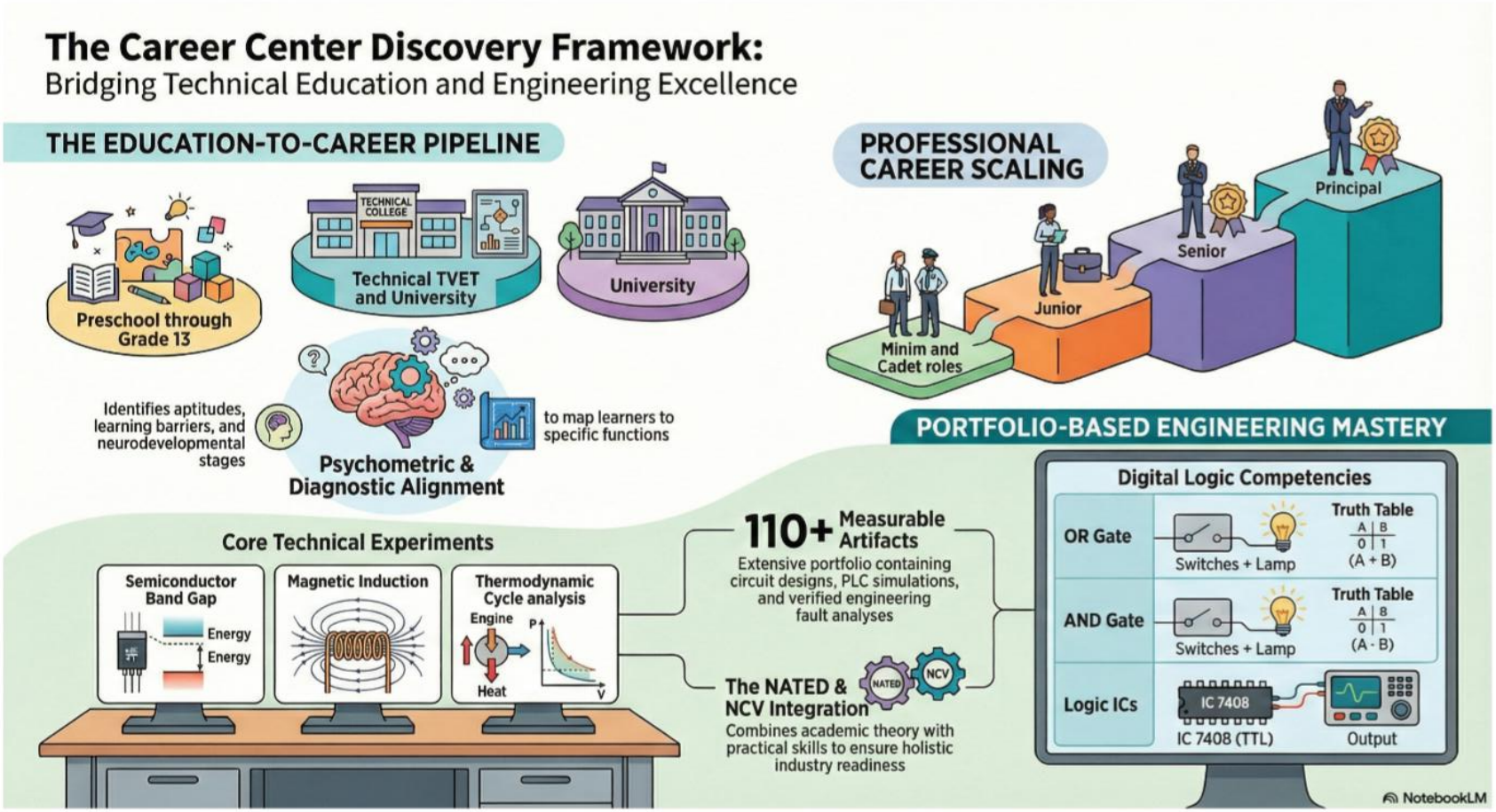
Security
Key Technical Focus: Risk & Complainte Management
Certification / Framework:

ICT
Key Technical Focus: AI, Cloud & Data Science
Certification / Framework:

ICT & Software Development

Proficiency in Salesforce Trailhead (22k+ points), GitHub version control, and full-stack software engineering.

NotebookLM


The Career Center Discovery Framework:
Bridging Technical Education and Engineering Excellence
THE EDUCATION-TO-CAREER PIPELINE
Preschool through Grade 13
TECHNICAL COLLEGE
Technical TVET and University
University
Identifies aptitudes, learning barriers, and neurodevelopmental stages
Psychometric & Diagnostic Alignment
to map learners to specific functions
PROFESSIONAL CAREER SCALING
Minim and Cadet roles
Junior
Senior
Principal
PORTFOLIO-BASED ENGINEERING MASTERY
Core Technical Experiments
Semiconductor Band Gap
Energy
Energy
Magnetic Induction
Thermodynamic Cycle analysis
Engine
P
Heat
V
110+ Measurable Artifacts
Extensive portfolio containing circuit designs, PLC simulations, and verified engineering fault analyses
The NATED & NCV Integration
NATED
NCV
Combines academic theory with practical skills to ensure holistic industry readiness
Digital Logic Competencies
OR Gate
Switches + Lamp
Truth Table
A B
0 1
(A + B)
AND Gate
Switches + Lamp
Truth Table
A B
0 1
(A · B)
Logic ICs
IC 7408
IC 7408 (TTL)
Output
NotebookLM

The Resilient Engineering Framework:
Bridging Technical Mastery and Systemic Governance

TECHNICAL & INCLUSIVE MASTERY

Multidisciplinary Engineering Core

Integration of heavy current systems, control theory, and robotics with advanced calculus foundations.

Inclusive Pedagogy Integration

Incorporating Montessori methods and Braille certification to broaden accessibility in technical education.

Industry-Aligned Curriculum

Direct alignment with NQF Level 6 standards and industry leaders like Schneider Electric and Eskom.

Schneider Electric + Eskom — NQF Level 6

CONTEXT: This framework explores the intersection of high-level electrical engineering, vocational education (NATED/NQF), and wholesaler trade. It presents a "dual-mastery" approach where technical proficiency is combined with bureaucratic resilience to navigate South Africa's certification backlogs and regulatory complexities.

STANDARD QUALIFICATION PARAMETERS	
SAQA Qualification ID	111285
NQF Level	Level 6
Total Credits	360 Credits

NAVIGATING SYSTEMIC GOVERNANCE

Bureaucratic Resilience

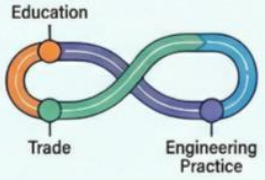
Strategies to manage certification backlogs and examination irregularities through robust record-keeping.

Audit-Ready Documentation

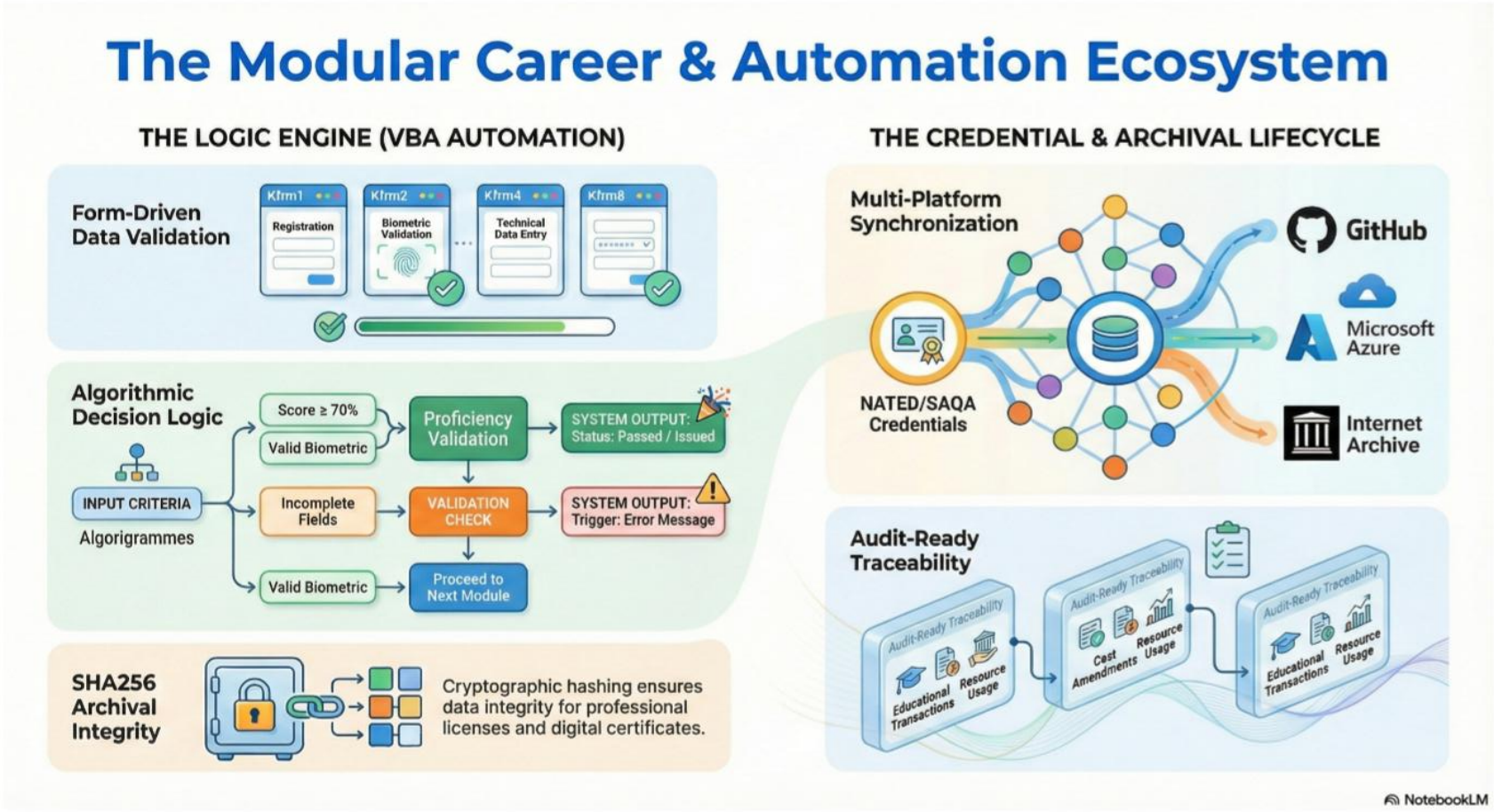
Utilizing VBA dashboards, portfolios of evidence, and blockchain for secure, transparent credentialing.

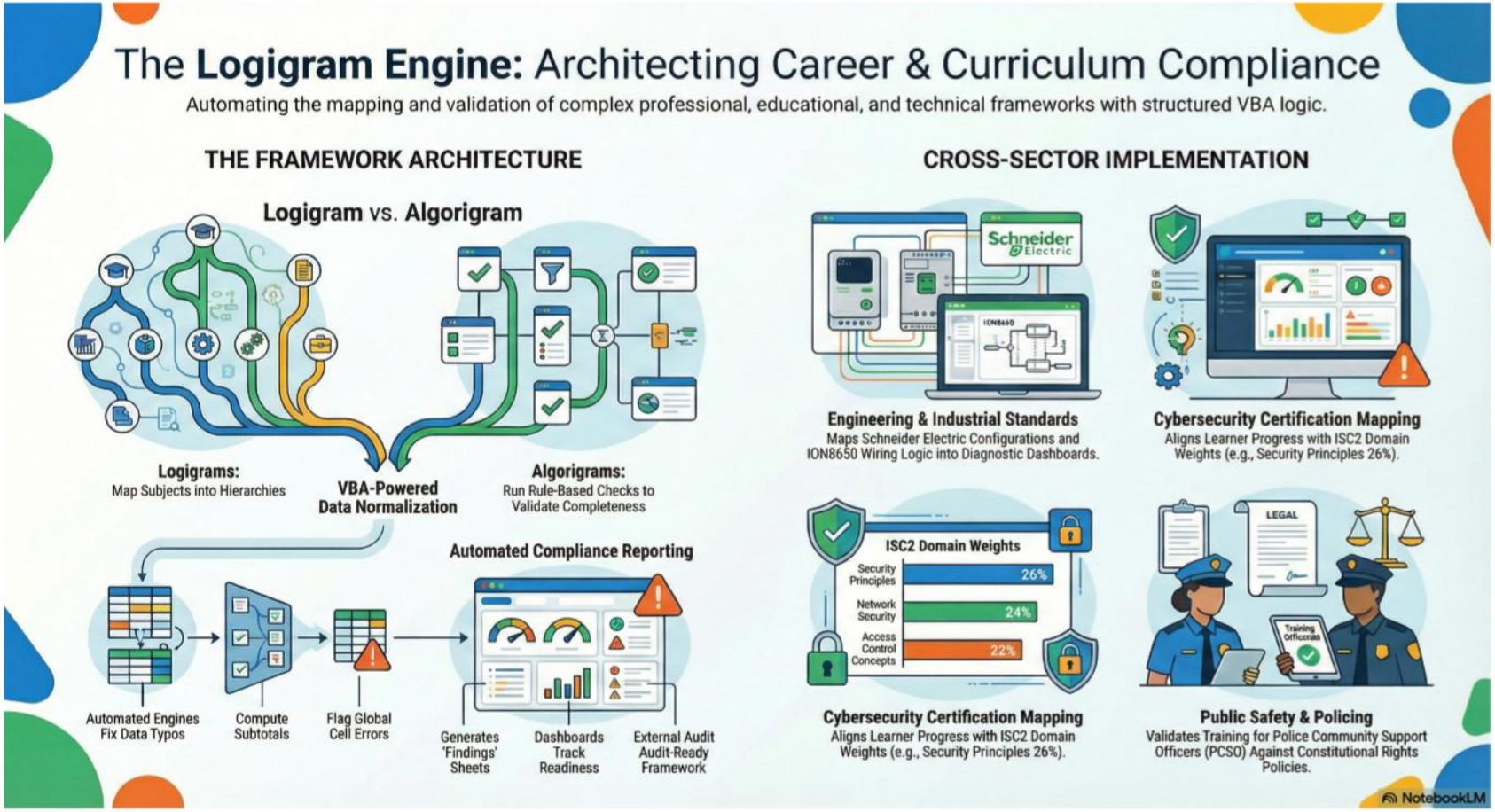
The "Living Document" Career

Viewing a career as a continuous synthesis of education, trade, and engineering practice.



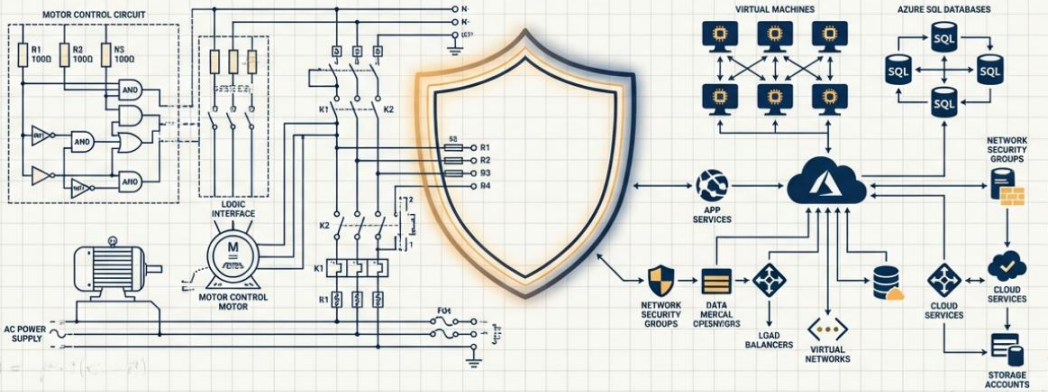
NotebookLM


The Modular Career & Automation Ecosystem
THE LOGIC ENGINE (VBA AUTOMATION)
THE CREDENTIAL & ARCHIVAL LIFECYCLE
Form-Driven Data Validation
Kfrm1
Registration
Kfrm2
Biometric Validation
Kfrm4
Technical Data Entry
Kfrm8
Algorithmic Decision Logic
INPUT CRITERIA
Algorigrammes
Score ≥ 70%
Valid Biometric
Proficiency Validation
SYSTEM OUTPUT: Status: Passed / Issued
Incomplete Fields
VALIDATION CHECK
SYSTEM OUTPUT: Trigger: Error Message
Valid Biometric
Proceed to Next Module
SHA256 Archival Integrity
Cryptographic hashing ensures data integrity for professional licenses and digital certificates.
Multi-Platform Synchronization
NATED/SAQA Credentials
GitHub
Microsoft Azure
Internet Archive
Audit-Ready Traceability
Audit-Ready Traceability
Educational Transactions
Resource Usage
Audit-Ready Traceability
Cost Amendments
Resource Usage
Audit-Ready Traceability
Educational Transactions
Resource Usage
NotebookLM


The Logigram Engine: Architecting Career & Curriculum Compliance
Automating the mapping and validation of complex professional, educational, and technical frameworks with structured VBA logic.
THE FRAMEWORK ARCHITECTURE
Logigram vs. Algorigram
Logigrams:
Map Subjects into Hierarchies
VBA-Powered Data Normalization
Algorigrams:
Run Rule-Based Checks to Validate Completeness
Automated Compliance Reporting
Automated Engines Fix Data Typos
Compute Subtotals
Flag Global Cell Errors
Generates 'Findings' Sheets
Dashboards Track Readiness
External Audit Audit-Ready Framework
CROSS-SECTOR IMPLEMENTATION
Schneider Electric
ION8650
Engineering & Industrial Standards
Maps Schneider Electric Configurations and ION8650 Wiring Logic into Diagnostic Dashboards.
Cybersecurity Certification Mapping
Aligns Learner Progress with ISC2 Domain Weights (e.g., Security Principles 26%).
ISC2 Domain Weights
Security Principles
26%
Network Security
24%
Access Control Concepts
22%
Cybersecurity Certification Mapping
Aligns Learner Progress with ISC2 Domain Weights (e.g., Security Principles 26%).
LEGAL
Training Officerials
Public Safety & Policing
Validates Training for Police Community Support Officers (PCSO) Against Constitutional Rights Policies.
NotebookLM

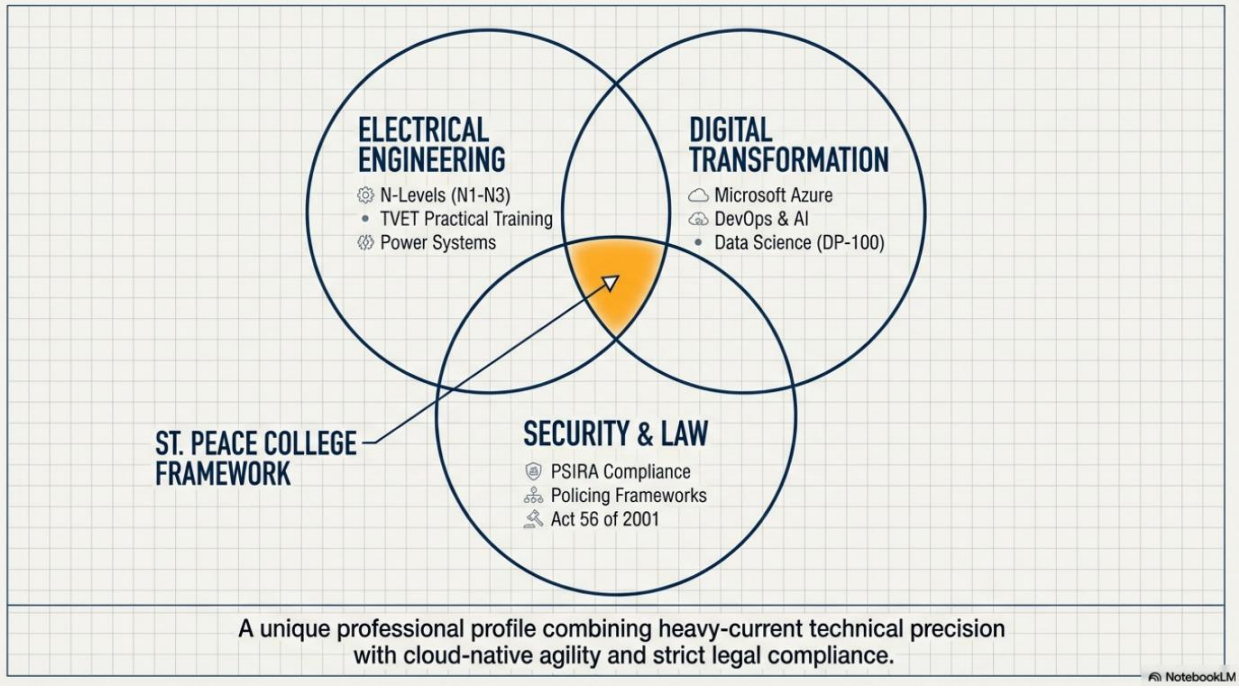
INTEGRATED ENGINEERING & EDUCATIONAL FRAMEWORKS

A Multidisciplinary Portfolio Bridging Electrical Theory, Digital Innovation, and Vocational Pedagogy.



Tshingombe Fiston (Tshitadi) | Project Lead & Facilitator

NotebookLM

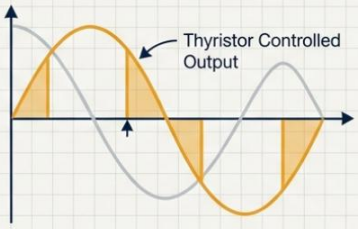


A unique professional profile combining heavy-current technical precision with cloud-native agility and strict legal compliance.

NotebookLM

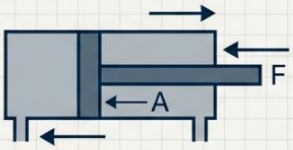
MASTERING THE FUNDAMENTALS OF POWER & PHYSICS

Rectification & Control



$$V_{mean} = \frac{\sqrt{2}}{2\pi} \times V_{RMS} \times (1 + \cos\alpha)$$

Thermodynamics & Pneumatics



P = F/A

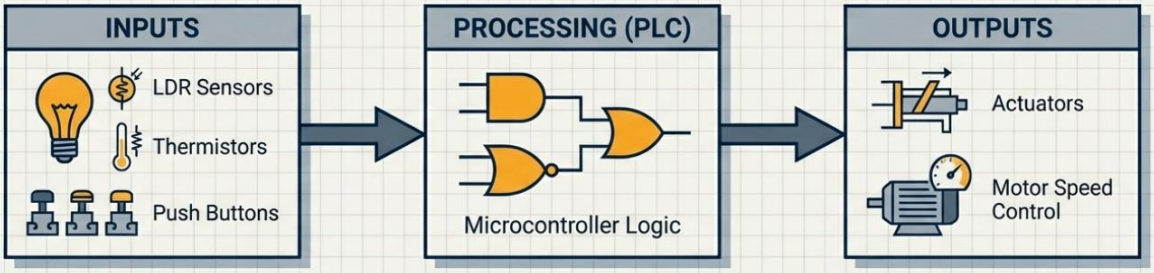
Outstroke: A′ · B′ + C

Core Competencies

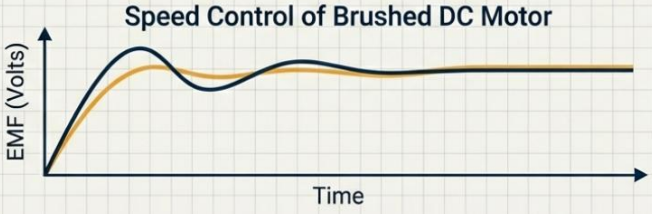
- AC/DC Machines
- Transmission Lines
- Industrial Electronics
- Material Science (Ferrous/Non-Ferrous)

NotebookLM

INDUSTRIAL CONTROL SYSTEMS & AUTOMATION



Speed Control of Brushed DC Motor




```
If pin 3=I then jump
If pin 2=I then main
```

NotebookLM

CLOUD ARCHITECTURE & DEVOPS PROFICIENCY

Azure Administrator Associate

DevOps Engineer Expert

Azure AI Solutions

Security, Compliance, and Identity Fundamentals

THE TECH STACK

Tools: Visual Studio, GitHub (Repo: kananga5), SQL Server

Methodology: CI/CD Pipelines (YAML), Agile Deployment

*"Participate in design review, development of **clean well-documented** code."*

NotebookLM

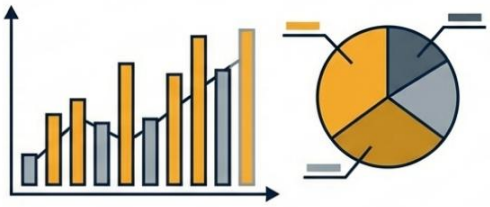
DATA SCIENCE & AI INTEGRATION

```
foreach (var item in collection) {

    do {
        process(data);
    } while (condition);
}
```

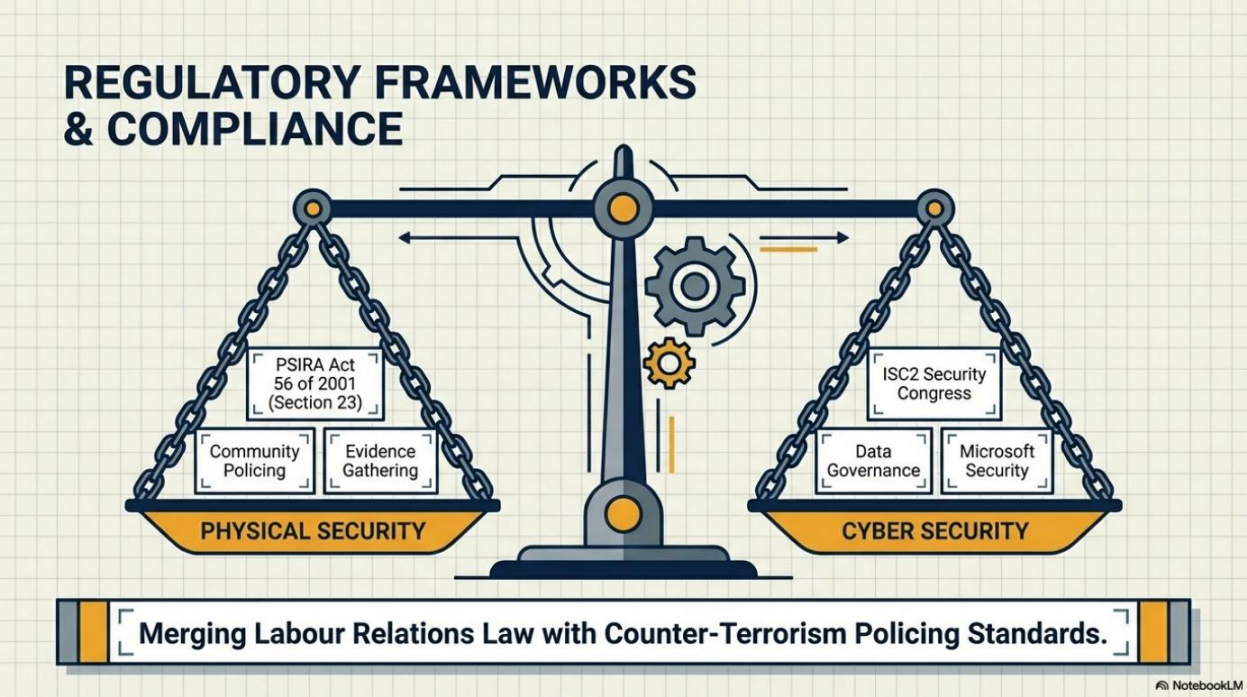
Methodology: Designing Data Science Solutions (DP-100)

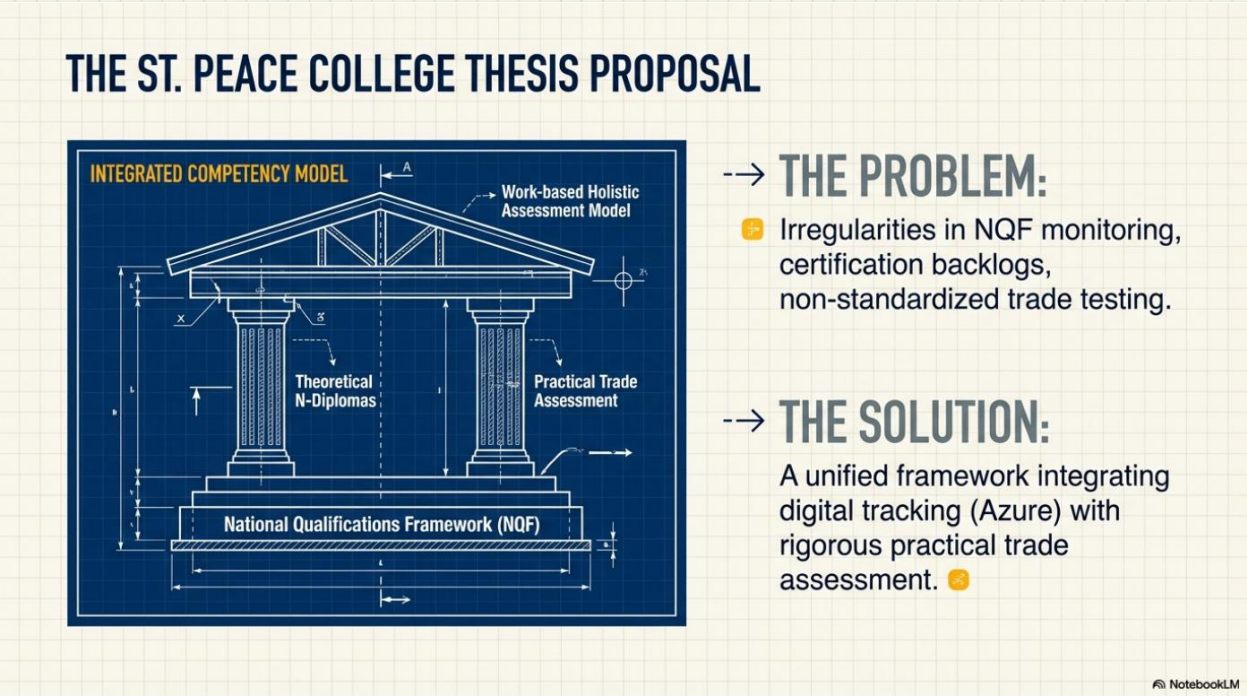
Azure Synapse Analytics Report

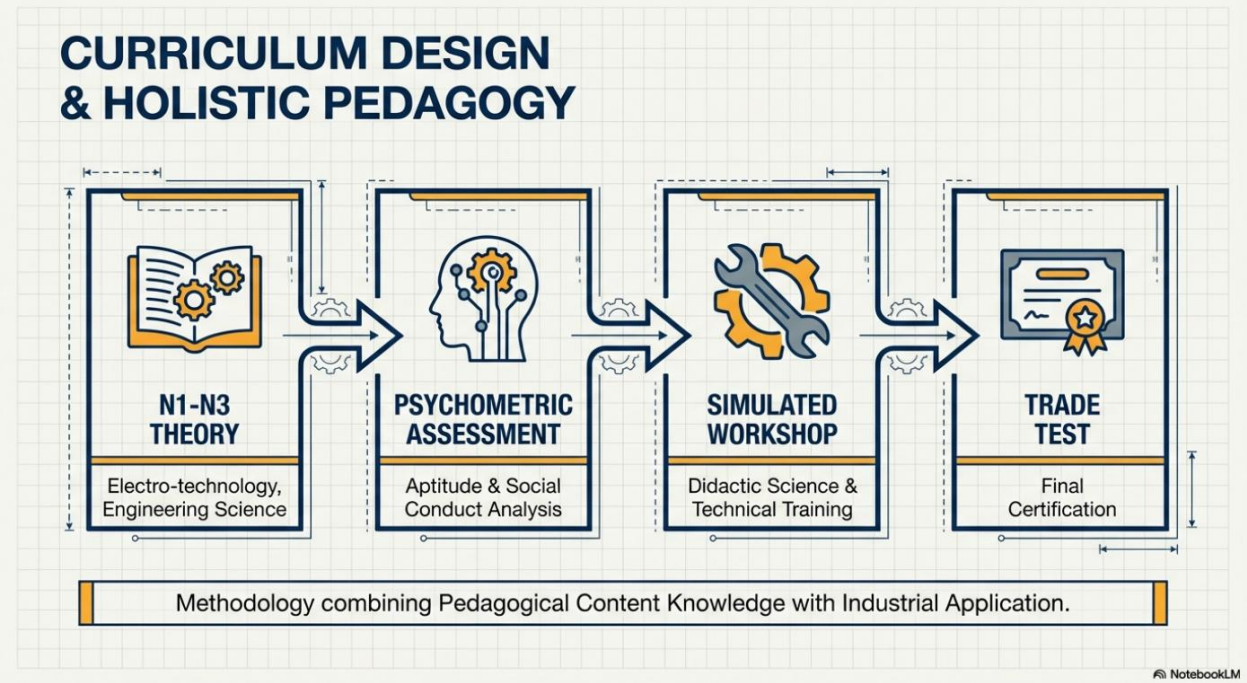


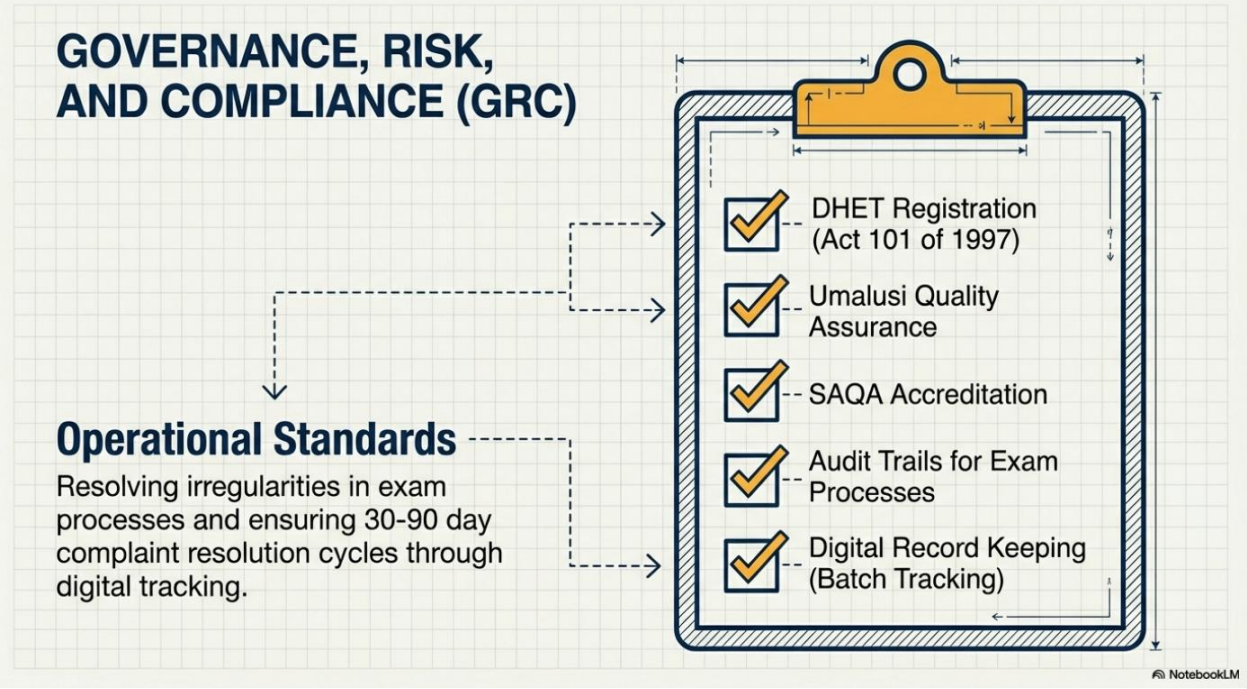
Application: Predictive Maintenance & Blue Print Assessment

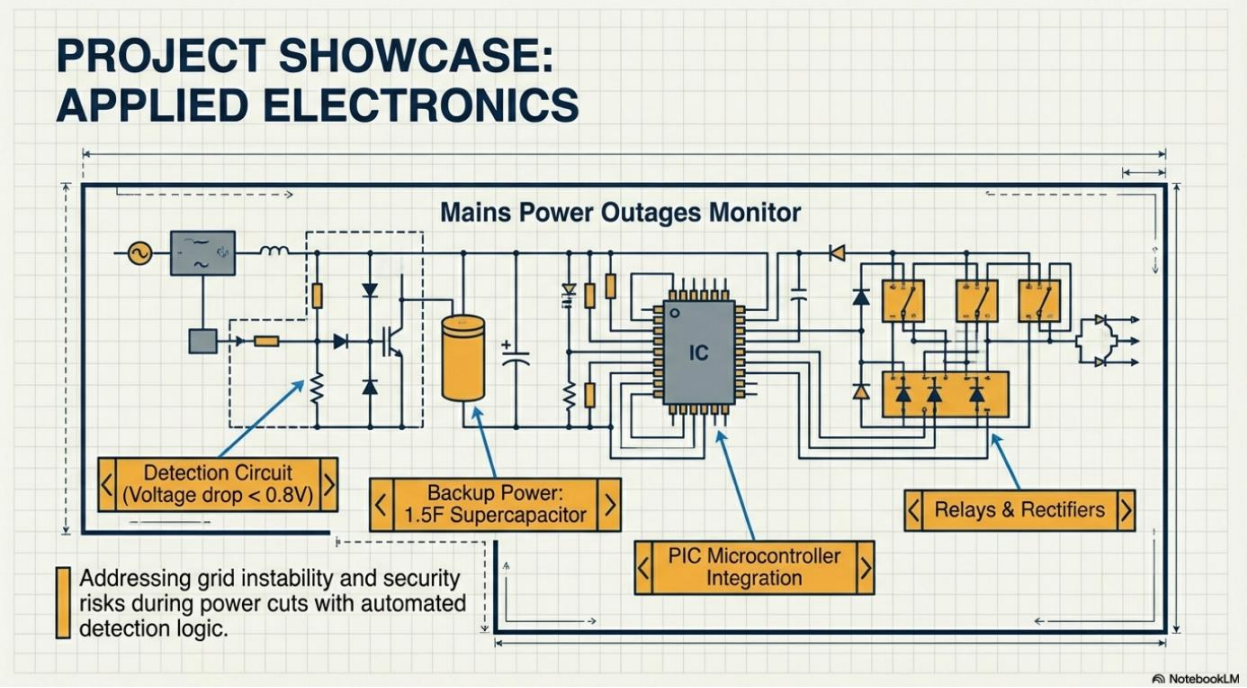
NotebookLM

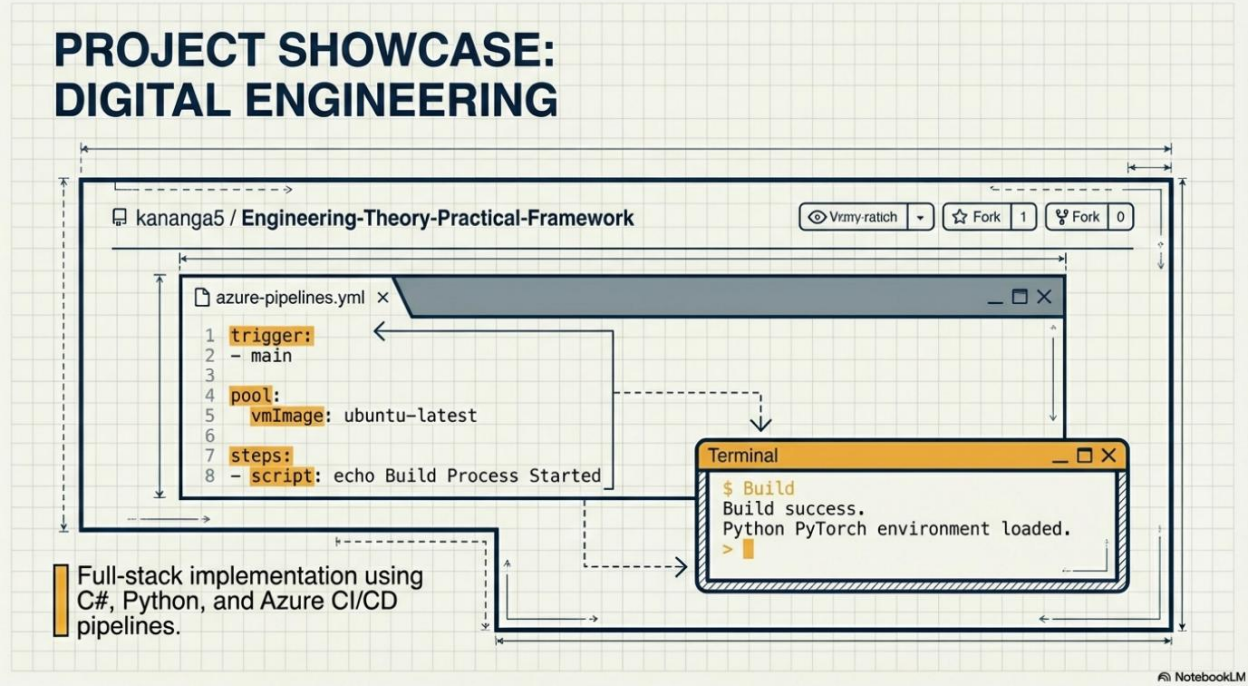

REGULATORY FRAMEWORKS
& COMPLIANCE
PSIRA Act
56 of 2001
(Section 23)
Community
Policing
Evidence
Gathering
PHYSICAL SECURITY
ISC2 Security
Congress
Data
Governance
Microsoft
Security
CYBER SECURITY
Merging Labour Relations Law with Counter-Terrorism Policing Standards.
NotebookLM

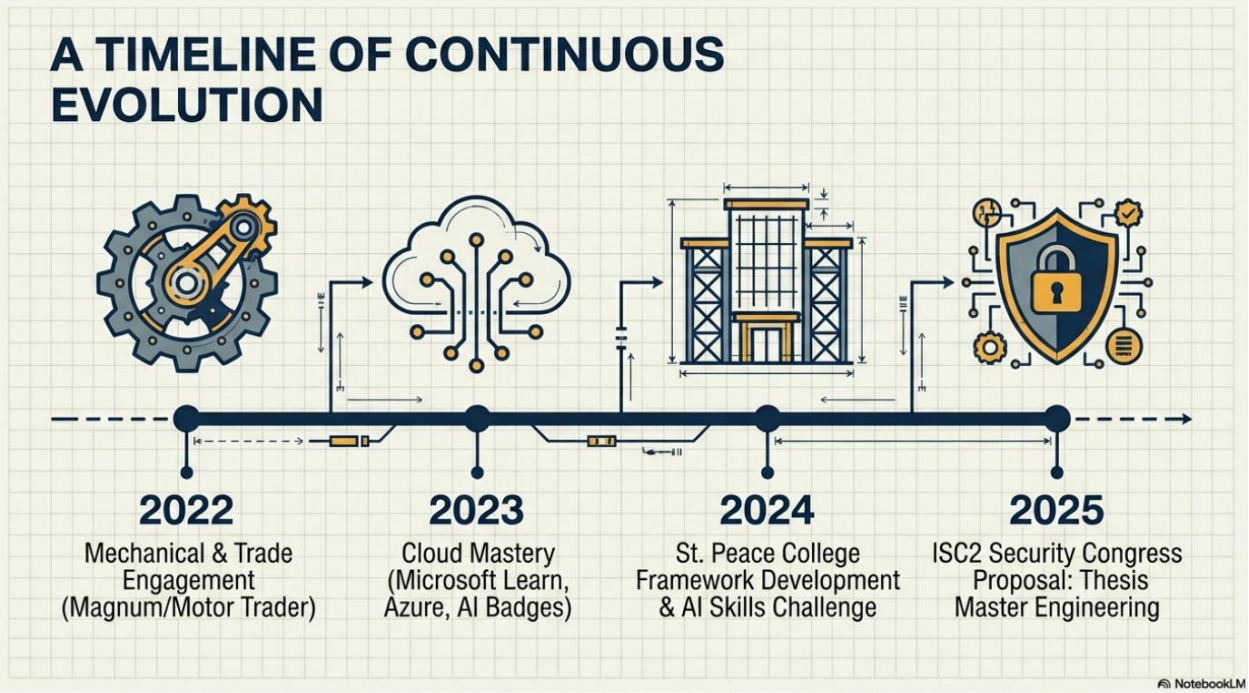

THE ST. PEACE COLLEGE THESIS PROPOSAL
INTEGRATED COMPETENCY MODEL
Work-based Holistic
Assessment Model
Theoretical
N-Diplomas
Practical Trade
Assessment
National Qualifications Framework (NQF)
THE PROBLEM:
Irregularities in NQF monitoring, certification backlogs, non-standardized trade testing.
THE SOLUTION:
A unified framework integrating digital tracking (Azure) with rigorous practical trade assessment.
NotebookLM

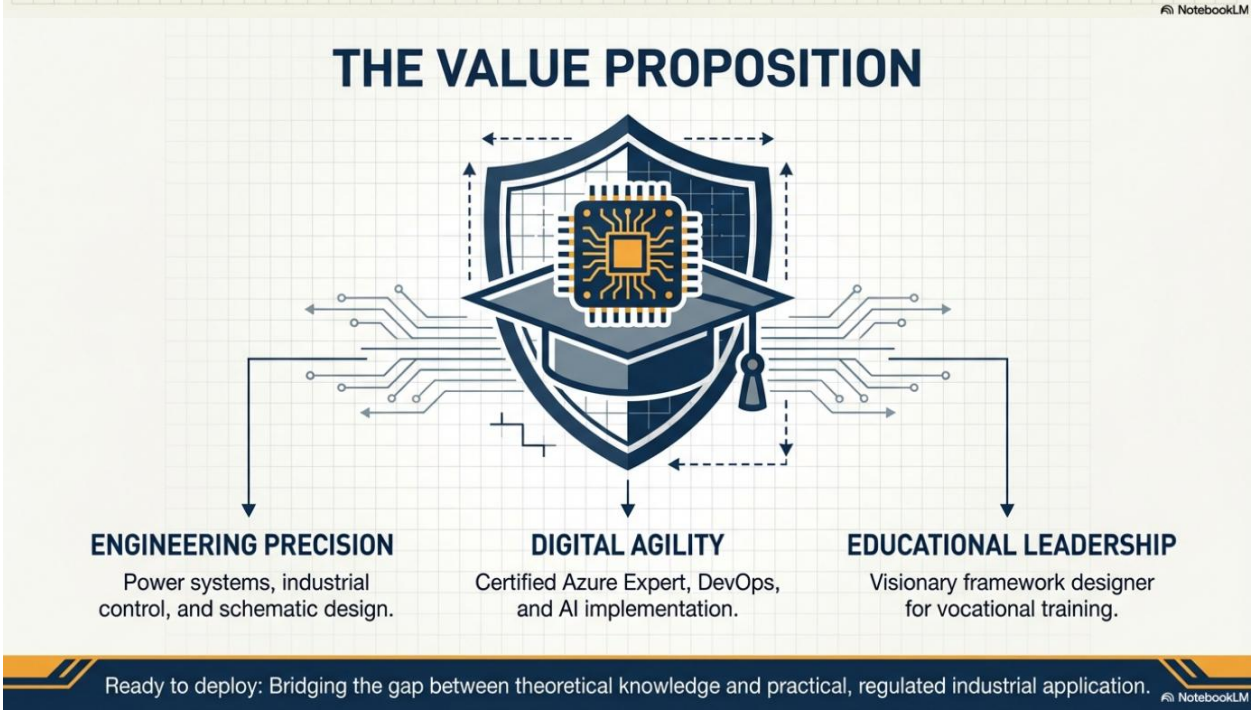

CURRICULUM DESIGN
& HOLISTIC PEDAGOGY
N1-N3
THEORY
Electro-technology,
Engineering Science
PSYCHOMETRIC
ASSESSMENT
Aptitude & Social
Conduct Analysis
SIMULATED
WORKSHOP
Didactic Science &
Technical Training
TRADE
TEST
Final
Certification
Methodology combining Pedagogical Content Knowledge with Industrial Application.
NotebookLM


GOVERNANCE, RISK,
AND COMPLIANCE (GRC)
DHET Registration
(Act 101 of 1997)
Umalusi Quality
Assurance
SAQA Accreditation
Audit Trails for Exam
Processes
Digital Record Keeping
(Batch Tracking)
Operational Standards
Resolving irregularities in exam processes and ensuring 30-90 day complaint resolution cycles through digital tracking.
NotebookLM


PROJECT SHOWCASE:
APPLIED ELECTRONICS
Mains Power Outages Monitor
IC
Detection Circuit
(Voltage drop < 0.8V)
Backup Power:
1.5F Supercapacitor
PIC Microcontroller
Integration
Relays & Rectifiers
Addressing grid instability and security risks during power cuts with automated detection logic.
NotebookLM


PROJECT SHOWCASE:
DIGITAL ENGINEERING
kananga5 / Engineering-Theory-Practical-Framework
Vrmy-ratich
Fork 1
Fork 0
azure-pipelines.yml
1 trigger:
2 - main
3
4 pool:
5 vmImage: ubuntu-latest
6
7 steps:
8 - script: echo Build Process Started
Terminal
$ Build
Build success.
Python PyTorch environment loaded.
Full-stack implementation using C#, Python, and Azure CI/CD pipelines.
NotebookLM


A TIMELINE OF CONTINUOUS EVOLUTION
2022
Mechanical & Trade Engagement (Magnum/Motor Trader)
2023
Cloud Mastery (Microsoft Learn, Azure, AI Badges)
2024
St. Peace College Framework Development & AI Skills Challenge
2025
ISC2 Security Congress Proposal: Thesis Master Engineering
NotebookLM


THE VALUE PROPOSITION
ENGINEERING PRECISION
Power systems, industrial control, and schematic design.
DIGITAL AGILITY
Certified Azure Expert, DevOps, and AI implementation.
EDUCATIONAL LEADERSHIP
Visionary framework designer for vocational training.
Ready to deploy: Bridging the gap between theoretical knowledge and practical, regulated industrial application.
NotebookLM

TSHINGOMBE FISTON (TSHITADI)

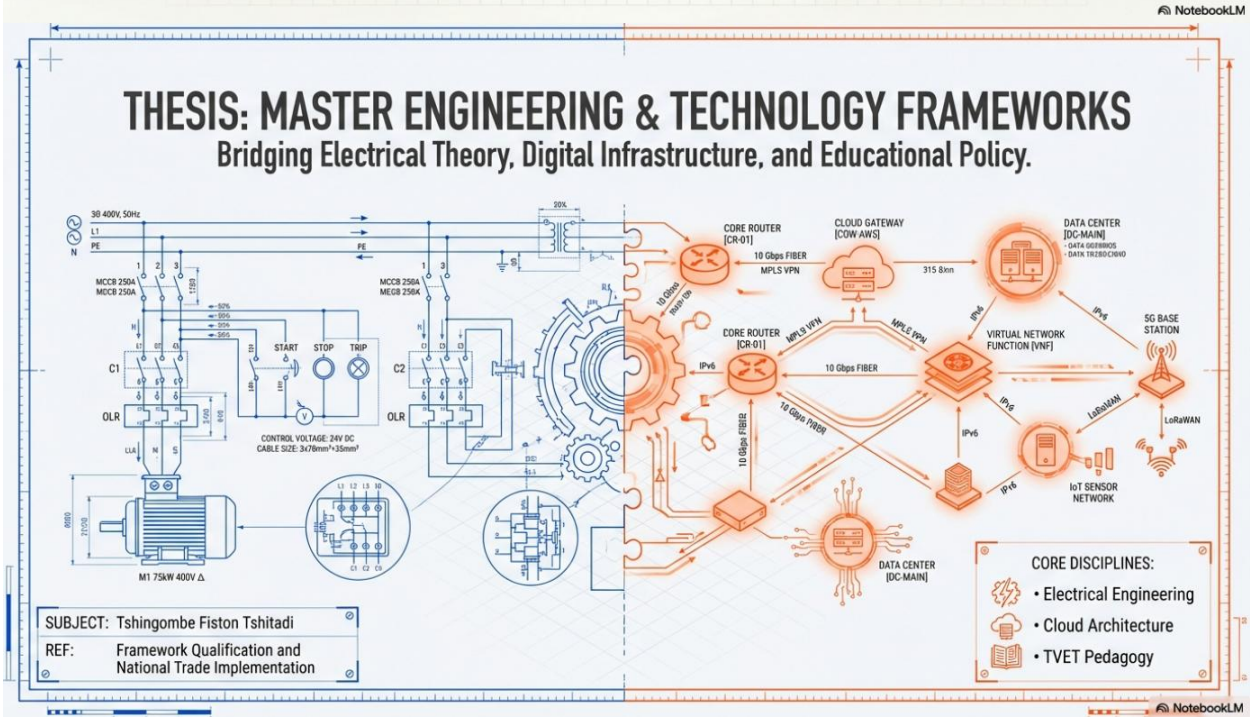
PROJECT LEAD | FACILITATOR | ENGINEER

GITHUB REPOSITORY

GITHUB REPOSITORY

github.com/kananga5
dev.azure.com/tshingombefiston0091

At the heart of solutions to framework qualification and national trade implementation.



LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks

DIN 1451
PROFESSIONAL PROFILE & OBJECTIVES

PROJECT LEAD

Management of technical infrastructure and educational frameworks. Designing stable trade marketing boards.

FACILITATOR

Specialized in TVET (Technical and Vocational Education and Training) and engineering pedagogy. Focusing on sub-sector training environments.

RESEARCHER

Governance, Risk, and Compliance (GRC) within security and energy sectors. Resolving framework qualifications.

MISSION STATEMENT: To design stable electro-kinematic systems while resolving framework qualifications in the sub-sector training environment.

NotebookLM

THEORETICAL FOUNDATION: ENGINEERING SCIENCE

FLUID MECHANICS

$$P = \frac{F}{A}$$

Application: Pneumatic Circuit Design (Outstroke/Instroke logic)

THERMODYNAMICS

$$PV = mRT$$

Application: Ideal Gas Law / Piston Calculations

CORE COMPETENCIES

- AC/DC Machines
- Transmission Lines
- Ferrous & Non-Ferrous Material Testing
- Industrial Safety Protocols

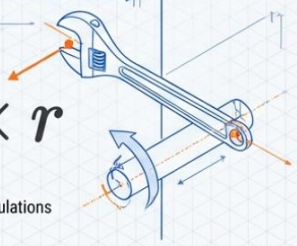
ELECTRICAL THEORY

$$V_{(\text{rms})} = \frac{\sqrt{2}}{2} \times V_{(\text{max})}$$

Application: AC/DC Machines & Transmission Lines

MECHANICAL TORQUE

$$T = F \times r$$



Application: Motor Controls & Torque Calculations

LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks

NotebookLM

LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks

ELECTRONIC CIRCUIT DESIGN & INSTRUMENTATION

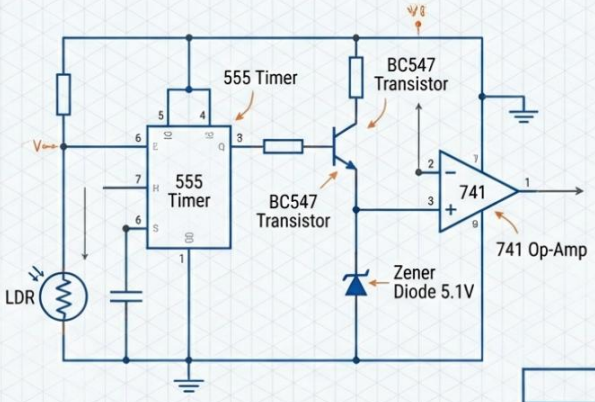
FEATURED PROJECTS

1. MAINS POWER OUTAGES MONITOR

Circuitry designed to monitor grid supply stability.

2. IR REMOTE CONTROL LIGHT DIMMER

Based on PIC18F1320 microcontroller architecture.



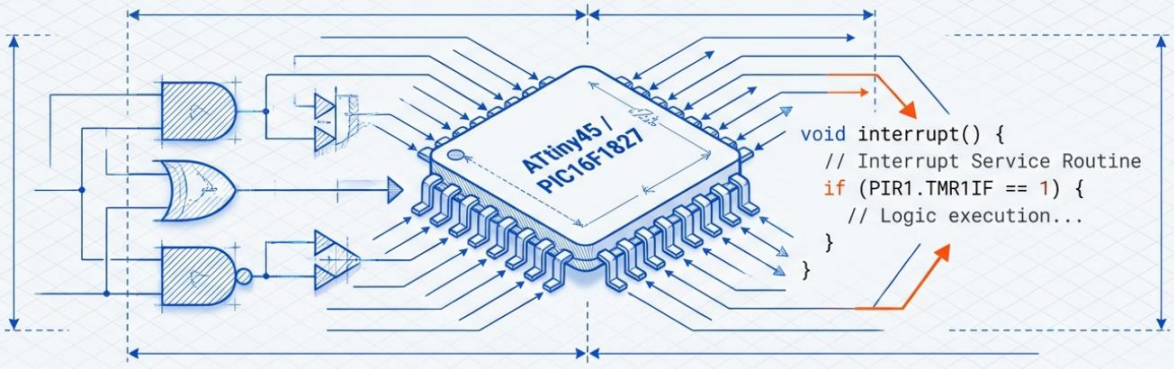
3. BEAM-BREAK FLASH TRIGGER

Infrared generation using LED1-LED3 and photodetectors.

Bill of Materials	
Source:	RS Components / Elektor
Comp:	Resistors, Capacitors, PCB Layout

NotebookLM

EMBEDDED SYSTEMS & MICRO-ARCHITECTURE

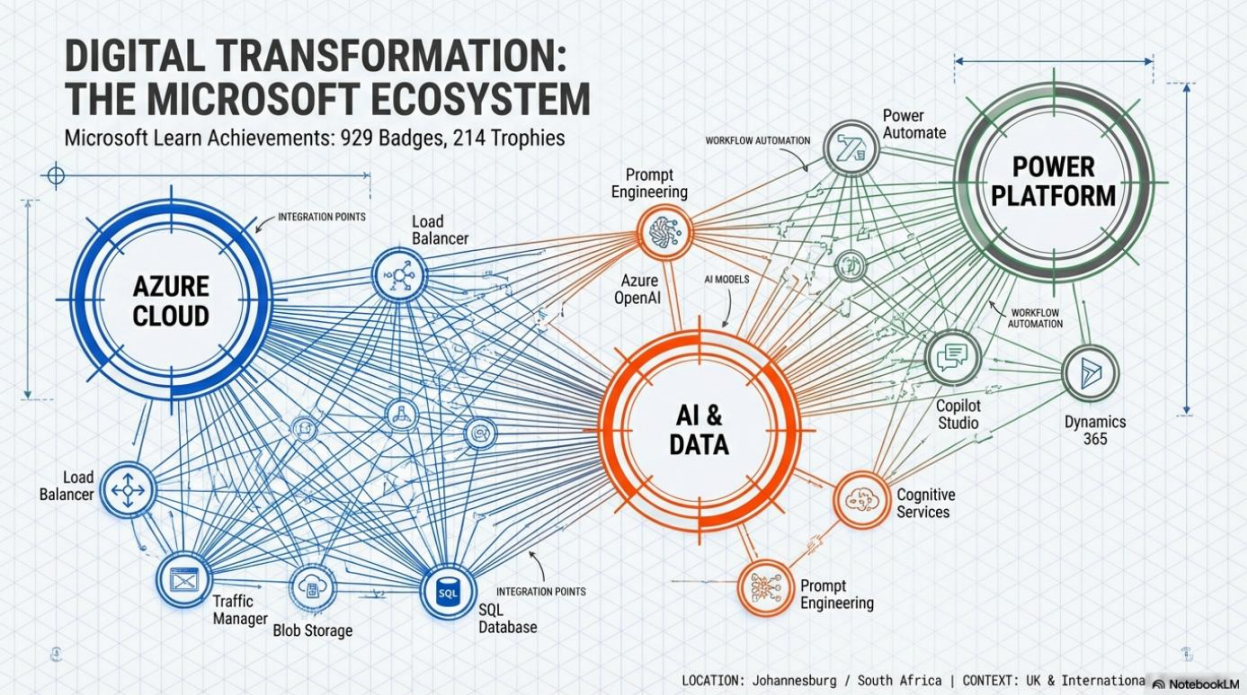


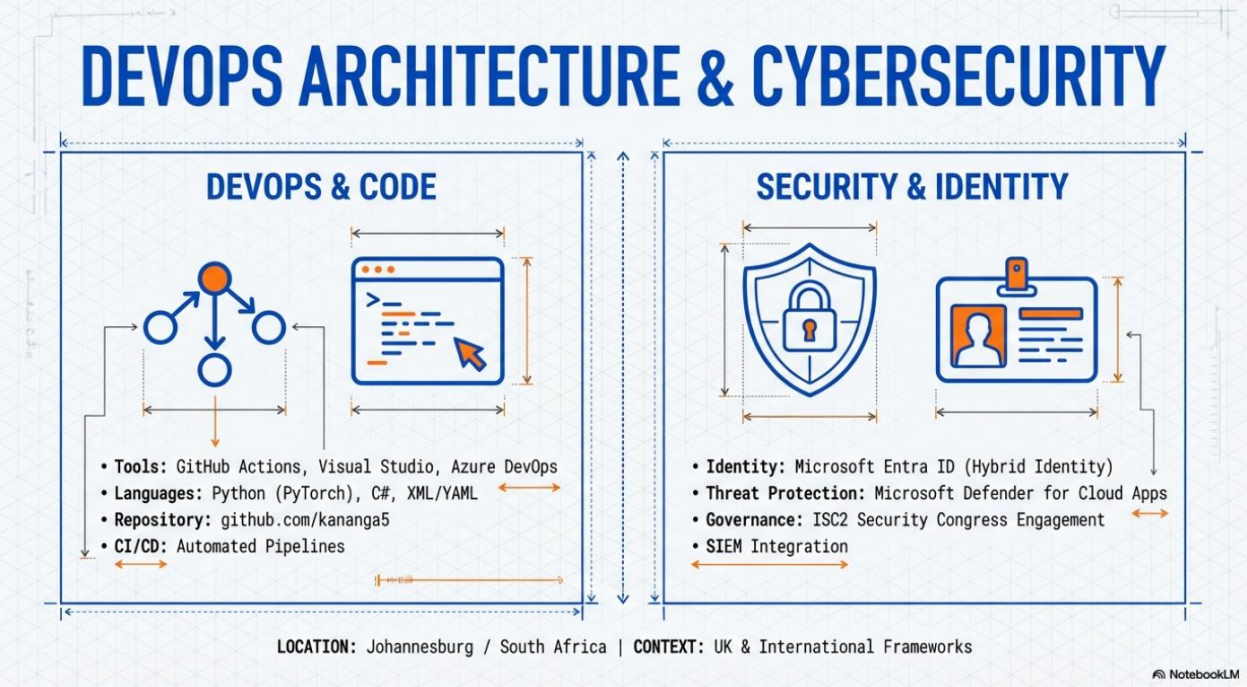
TECHNICAL SPECS

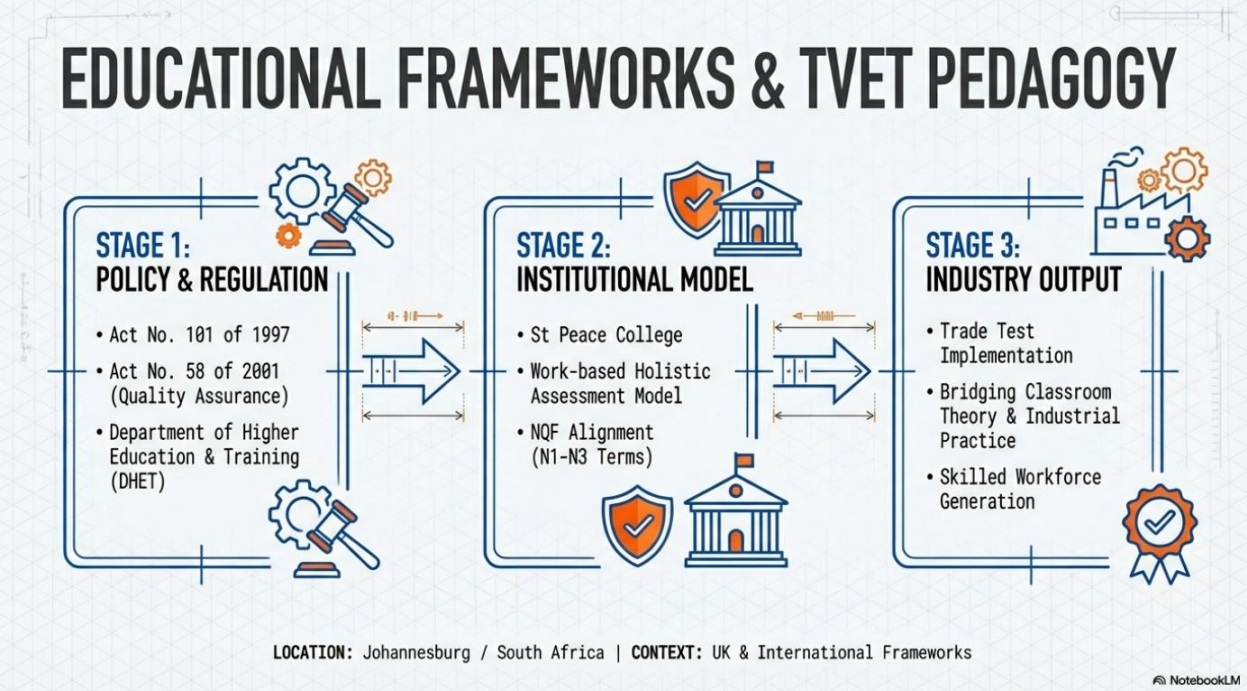
- Platforms: Arduino, ChipKit
- Logic: Watchdog Timers, Brown-out Detectors
- ISR: Interrupt Service Routines
- Application: Automated sensing (Temp/Humidity/Light)

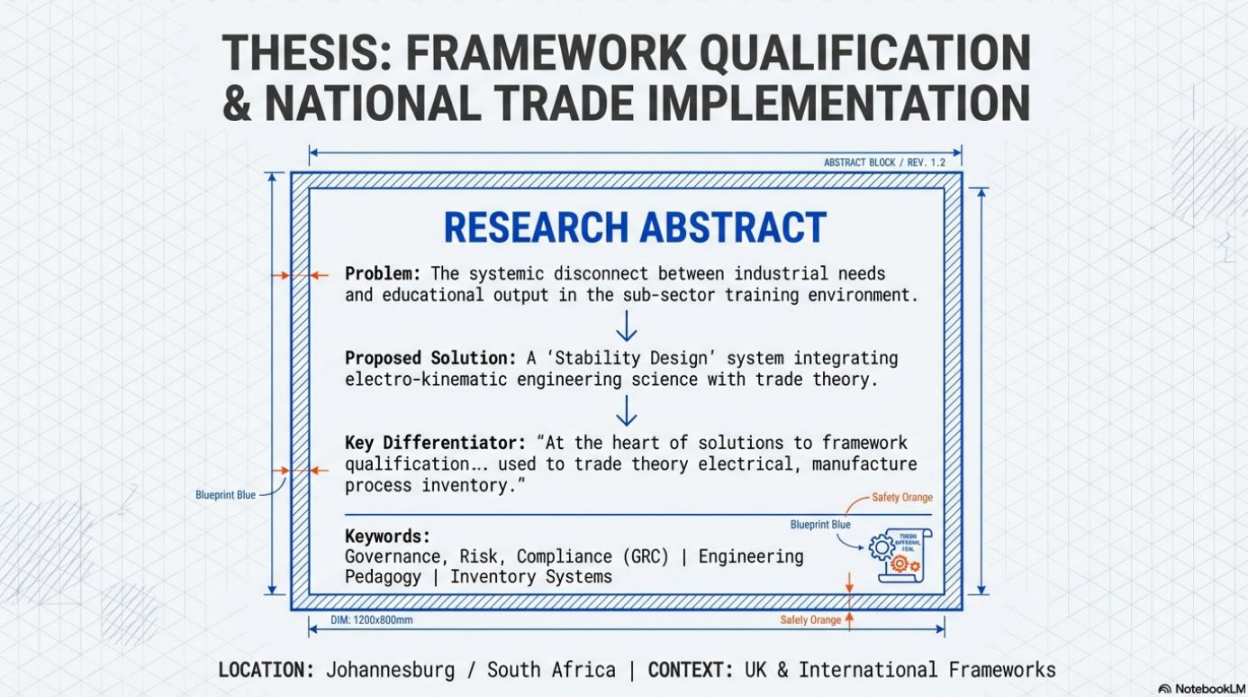
LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks

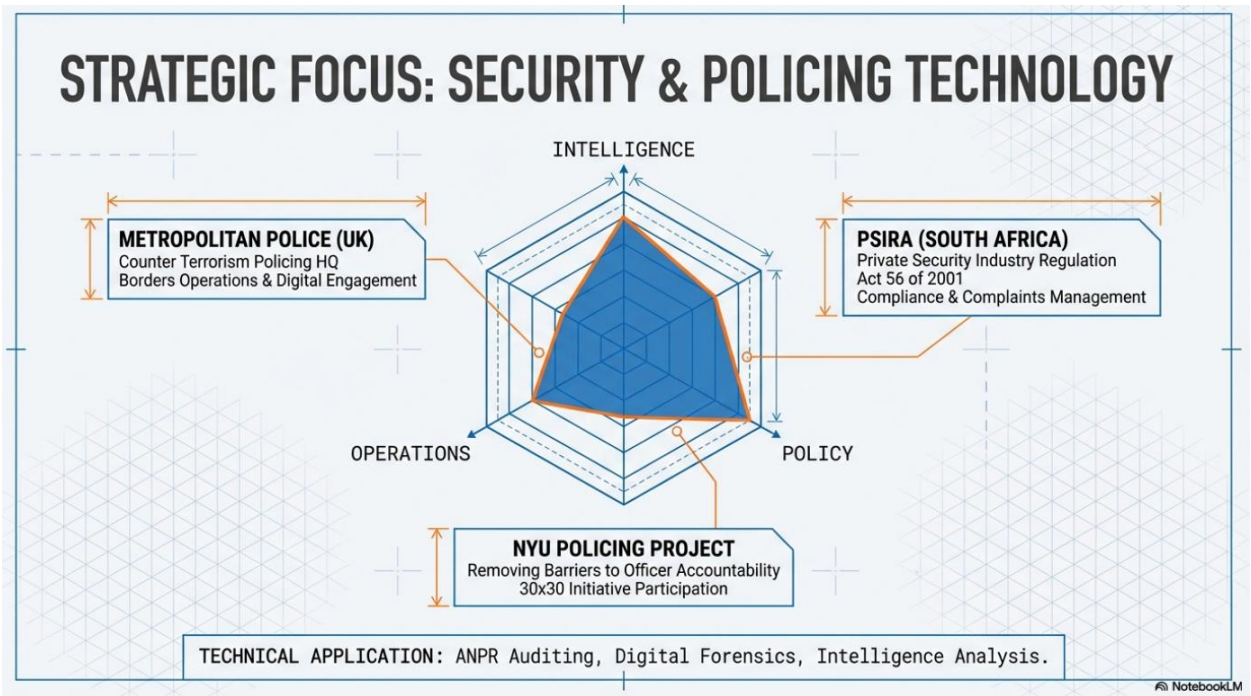
NotebookLM

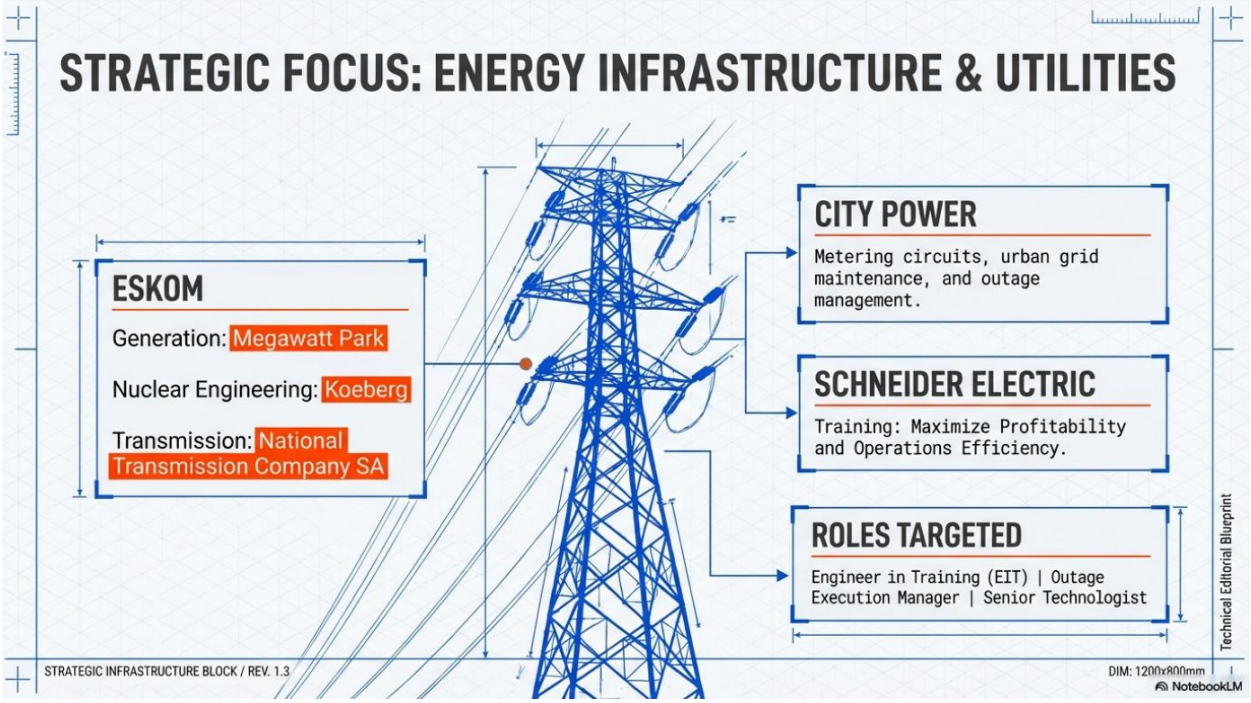

DIGITAL TRANSFORMATION:
THE MICROSOFT ECOSYSTEM
Microsoft Learn Achievements: 929 Badges, 214 Trophies
AZURE CLOUD
INTEGRATION POINTS
Load Balancer
Load Balancer
Traffic Manager
Blob Storage
SQL
SQL Database
INTEGRATION POINTS
Prompt Engineering
Azure OpenAI
AI MODELS
AI & DATA
WORKFLOW AUTOMATION
Power Automate
POWER PLATFORM
WORKFLOW AUTOMATION
Copilot Studio
Dynamics 365
Cognitive Services
Prompt Engineering
LOCATION: Johannesburg / South Africa | CONTEXT: UK & Internationa
NotebookLM

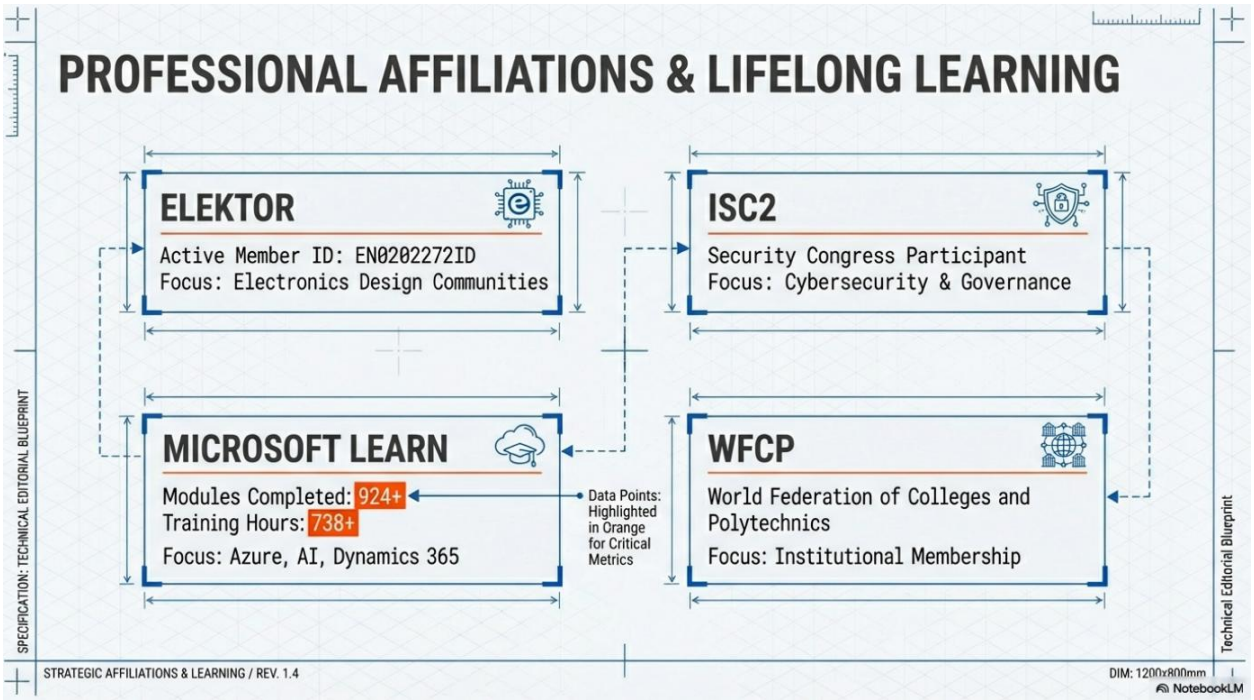

DEVOPS ARCHITECTURE & CYBERSECURITY
DEVOPS & CODE
• Tools: GitHub Actions, Visual Studio, Azure DevOps
• Languages: Python (PyTorch), C#, XML/YAML
• Repository: github.com/kananga5
• CI/CD: Automated Pipelines
SECURITY & IDENTITY
• Identity: Microsoft Entra ID (Hybrid Identity)
• Threat Protection: Microsoft Defender for Cloud Apps
• Governance: ISC2 Security Congress Engagement
• SIEM Integration
LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks
NotebookLM

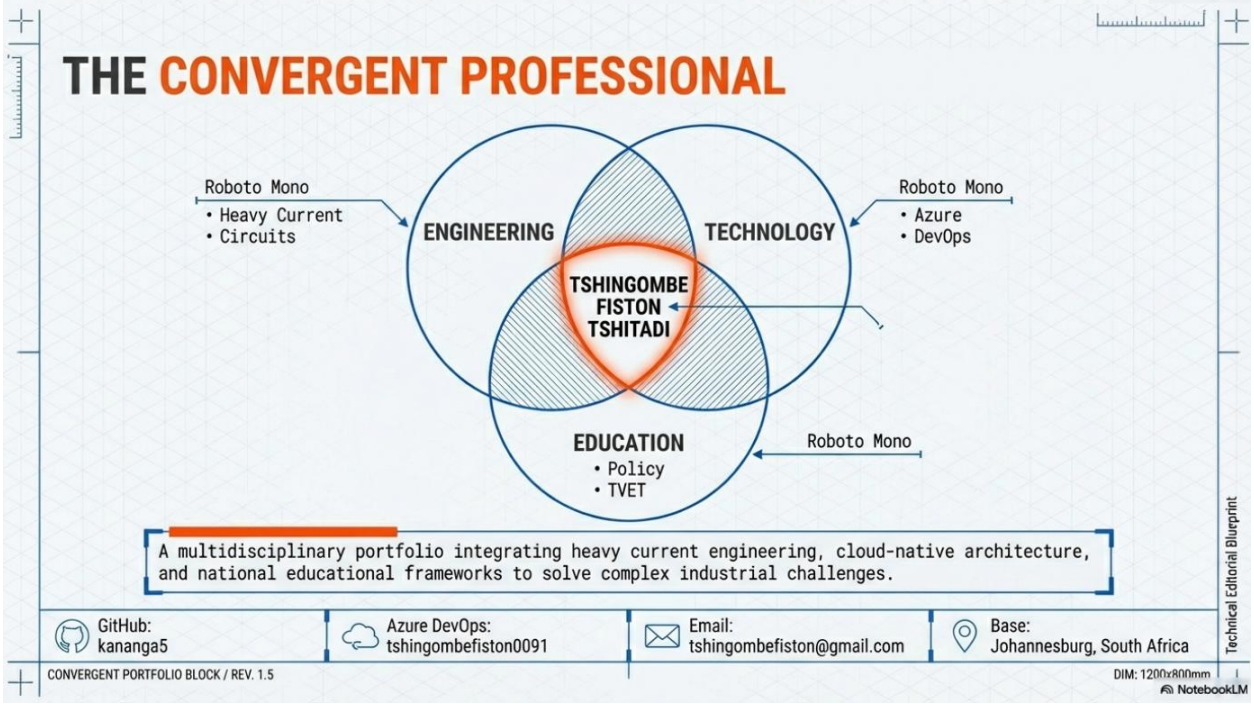

EDUCATIONAL FRAMEWORKS & TVET PEDAGOGY
STAGE 1:
POLICY & REGULATION
• Act No. 101 of 1997
• Act No. 58 of 2001 (Quality Assurance)
• Department of Higher Education & Training (DHET)
STAGE 2:
INSTITUTIONAL MODEL
• St Peace College
• Work-based Holistic Assessment Model
• NQF Alignment (N1-N3 Terms)
STAGE 3:
INDUSTRY OUTPUT
• Trade Test Implementation
• Bridging Classroom Theory & Industrial Practice
• Skilled Workforce Generation
LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks
NotebookLM

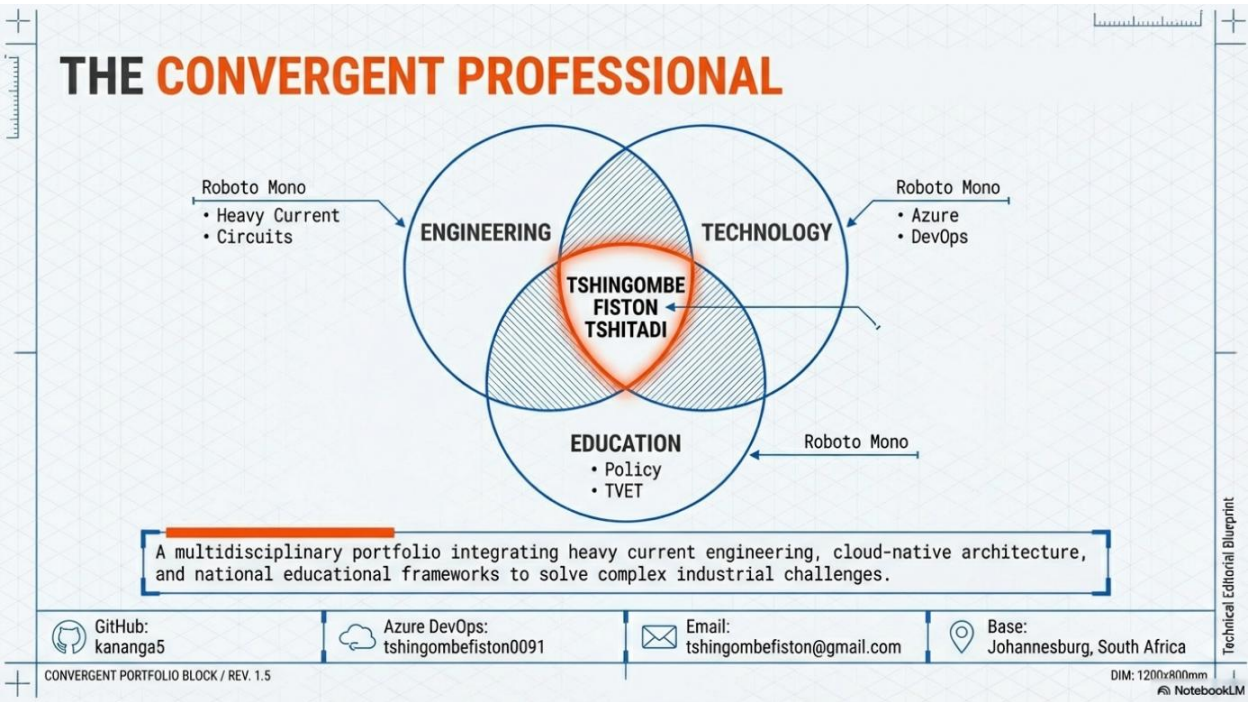

THESIS: FRAMEWORK QUALIFICATION & NATIONAL TRADE IMPLEMENTATION
ABSTRACT BLOCK / REV. 1.2
RESEARCH ABSTRACT
Problem: The systemic disconnect between industrial needs and educational output in the sub-sector training environment.
Proposed Solution: A 'Stability Design' system integrating electro-kinematic engineering science with trade theory.
Key Differentiator: "At the heart of solutions to framework qualification... used to trade theory electrical, manufacture process inventory."
Blueprint Blue
Safety Orange
Blueprint Blue
Keywords:
Governance, Risk, Compliance (GRC) | Engineering Pedagogy | Inventory Systems
DIM: 1200x800mm
Safety Orange
LOCATION: Johannesburg / South Africa | CONTEXT: UK & International Frameworks
NotebookLM

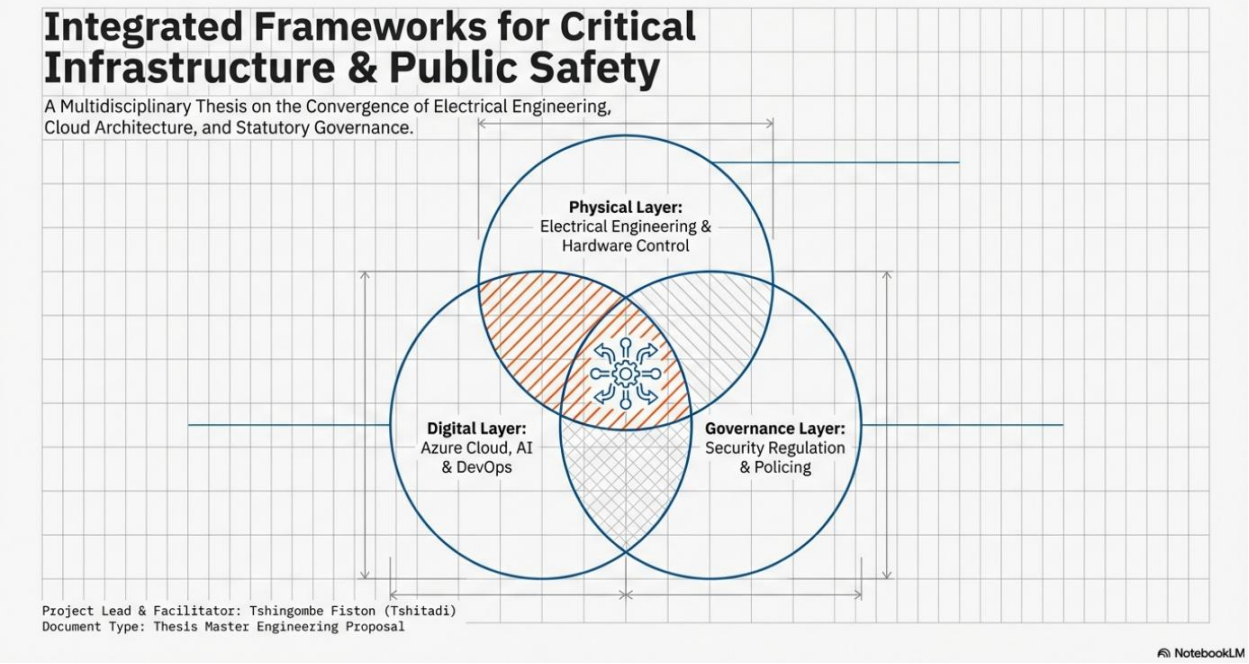

STRATEGIC FOCUS: SECURITY & POLICING TECHNOLOGY
INTELLIGENCE
METROPOLITAN POLICE (UK)
Counter Terrorism Policing HQ
Borders Operations & Digital Engagement
PSIRA (SOUTH AFRICA)
Private Security Industry Regulation Act 56 of 2001
Compliance & Complaints Management
OPERATIONS
POLICY
NYU POLICING PROJECT
Removing Barriers to Officer Accountability
30x30 Initiative Participation
TECHNICAL APPLICATION: ANPR Auditing, Digital Forensics, Intelligence Analysis.
NotebookLM


STRATEGIC FOCUS: ENERGY INFRASTRUCTURE & UTILITIES
ESKOM
Generation: Megawatt Park
Nuclear Engineering: Koeberg
Transmission: National Transmission Company SA
CITY POWER
Metering circuits, urban grid maintenance, and outage management.
SCHNEIDER ELECTRIC
Training: Maximize Profitability and Operations Efficiency.
ROLES TARGETED
Engineer in Training (EIT) | Outage Execution Manager | Senior Technologist
STRATEGIC INFRASTRUCTURE BLOCK / REV. 1.3
DIM: 1200x800mm
Technical Editorial Blueprint
NotebookLM


PROFESSIONAL AFFILIATIONS & LIFELONG LEARNING
ELEKTOR
Active Member ID: EN0202272ID
Focus: Electronics Design Communities
ISC2
Security Congress Participant
Focus: Cybersecurity & Governance
MICROSOFT LEARN
Modules Completed: 924+
Training Hours: 738+
Focus: Azure, AI, Dynamics 365
Data Points: Highlighted in Orange for Critical Metrics
WFCP
World Federation of Colleges and Polytechnics
Focus: Institutional Membership
SPECIFICATION: TECHNICAL EDITORIAL BLUEPRINT
Technical Editorial Blueprint
STRATEGIC AFFILIATIONS & LEARNING / REV. 1.4
DIM: 1200x800mm
NotebookLM


THE CONVERGENT PROFESSIONAL
Roboto Mono
• Heavy Current
• Circuits
ENGINEERING
TECHNOLOGY
Roboto Mono
• Azure
• DevOps
TSHINGOMBE FISTON TSHITADI
EDUCATION
• Policy
• TVET
Roboto Mono
A multidisciplinary portfolio integrating heavy current engineering, cloud-native architecture, and national educational frameworks to solve complex industrial challenges.
GitHub: kananga5
Azure DevOps: tshingombefiston0091
Email: tshingombefiston@gmail.com
Base: Johannesburg, South Africa
Technical Editorial Blueprint
CONVERGENT PORTFOLIO BLOCK / REV. 1.5
DIM: 1200x800mm
NotebookLM


THE CONVERGENT PROFESSIONAL
Roboto Mono
• Heavy Current
• Circuits
ENGINEERING
TECHNOLOGY
Roboto Mono
• Azure
• DevOps
TSHINGOMBE
FISTON
TSHITADI
EDUCATION
• Policy
• TVET
Roboto Mono
A multidisciplinary portfolio integrating heavy current engineering, cloud-native architecture, and national educational frameworks to solve complex industrial challenges.
GitHub:
kananga5
Azure DevOps:
tshingombefiston0091
Email:
tshingombefiston@gmail.com
Base:
Johannesburg, South Africa
Technical Editorial Blueprint
CONVERGENT PORTFOLIO BLOCK / REV. 1.5
DIM: 1200x800mm
NotebookLM

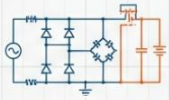

Integrated Frameworks for Critical Infrastructure & Public Safety
A Multidisciplinary Thesis on the Convergence of Electrical Engineering, Cloud Architecture, and Statutory Governance.
Physical Layer:
Electrical Engineering & Hardware Control
Digital Layer:
Azure Cloud, AI & DevOps
Governance Layer:
Security Regulation & Policing
Project Lead & Facilitator: Tshingombe Fiston (Tshitadi)
Document Type: Thesis Master Engineering Proposal
NotebookLM

THE POLYMATH PROFILE

Bridging Hardware, Software, and Law

ENGINEERING

- Electrical Engineering (N-Diploma/Nated)



- Power Systems & Mercury Rectifiers

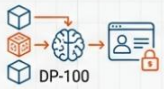
- Motor Control & Pneumatics

- Experimental Workplace Industrial Training

TECHNOLOGY

- Microsoft Certified: Azure AI & DevOps Engineer

- GitHub Contributor (Python/C#)



- Data Science (DP-100) & Identity Management

- Repository: Kananga5

SECURITY

- PSIRA Registered (Act 56 of 2001)

- Counter-Terrorism & VIP Protection Research

- Traffic Management & Accident Analysis

- Community Policing & Creative Law Response

At the heart of solutions to **framework qualification** and **national trade implementation sub-sector training**.

NotebookLM

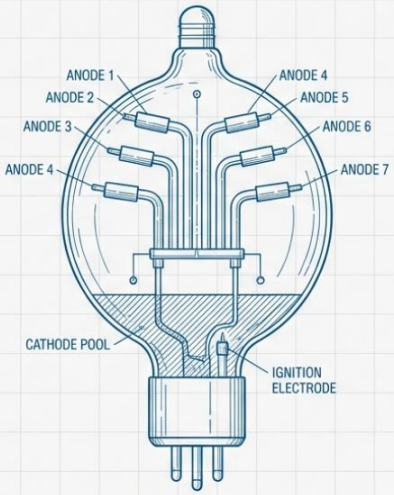
Pillar I: High-Power Systems & Rectification Theory

MERCURY ARC PHYSICS

- Technology: Industrial AC-to-DC conversion for traction systems.
- Specification: 6-phase rectification operating at 150A to 500A.
- Mechanism: Liquid mercury cathode with ignition electrodes.
- Voltage Drop: Approx 20-30V arc drop.

MODERN TRANSITION

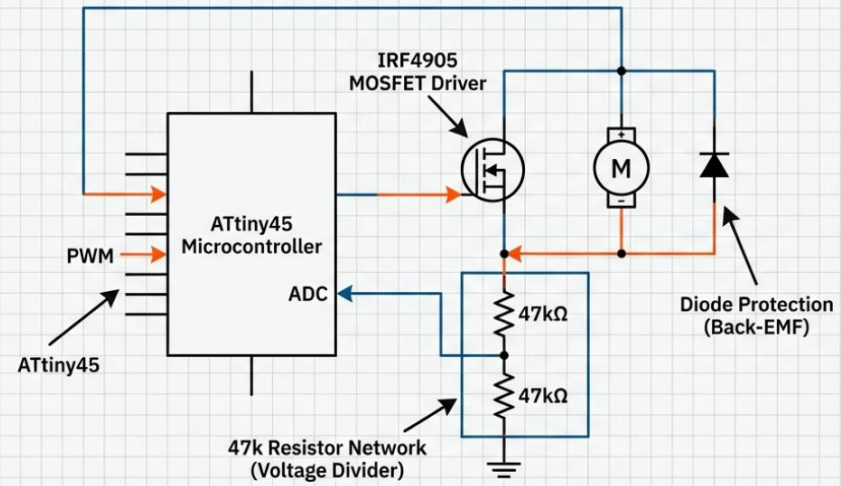
- Evolution from mercury vapor tanks to solid-state thyristors.
- Application in heavy transport infrastructure and substations.
- Reference: "Peculiar Parts" series & historical engineering notes.



NotebookLM

Applied Engineering: Sensorless Speed Control

Brushed DC Motor Implementation



THE CHALLENGE:

Controlling RPM under varying torque without a tachogenerator.

THE SOLUTION:

EMF Measurement Technique. Using back-EMF generated during the PWM "off" cycle to calculate speed and adjust duty cycle.

OUTCOME:

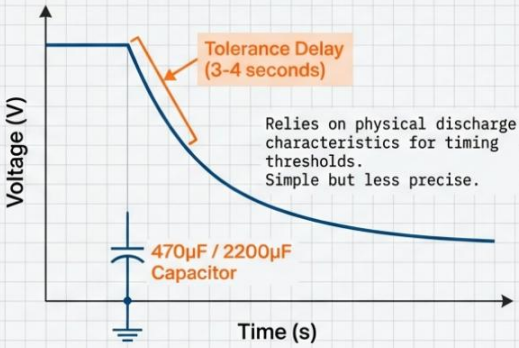
Cost-effective feedback loop for industrial automation.

NotebookLM

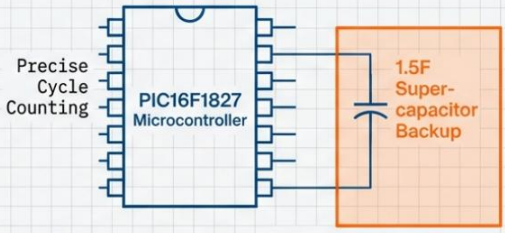
Grid Stability: Mains Power Outage Monitor

Critical Infrastructure Resilience

Analog Logic Path



Digital Logic Path



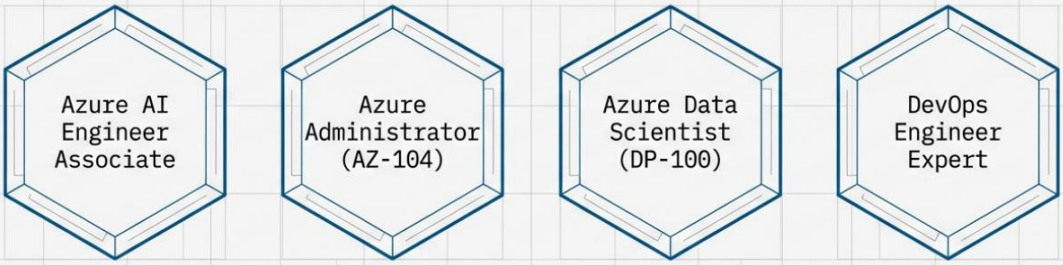
IBM Plex Mono
Ensures logic retention and orderly shutdown during total failure.
Microsecond precision.

APPLICATION: Automated signaling for alarm systems and industrial equipment protection during load-shedding events (Eskom context).

NotebookLM

Pillar II: Cloud Architecture & AI

The Digital Transformation Layer



GENERATIVE AI

Building apps with Azure OpenAI and Copilot Studio.
Prompt Engineering & Vector Search.

IDENTITY SECURITY

Microsoft Entra ID (formerly Azure AD).
Hybrid identity solutions & Access Management.

DATA GOVERNANCE

Regulatory compliant data warehouses.
Azure Synapse Analytics pipelines.

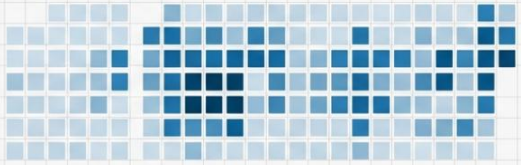
NotebookLM

Software Engineering & DevOps Pipelines

THE CODE

```
trigger:
  - main
pool:
  vmImage: ubuntu-latest
steps:
- script: echo Hello, world!
  displayName: 'Run a one-line script'
- script: |
    echo Add other tasks to build,
    test, and deploy.
```

THE WORKFLOW



- **Repository:** Kananga5
- **Languages:** Python, C# (Variable data handling, looping logic)
- **Issue Tracking:** Visual Studio Support Ticket #2403110060003192

NotebookLM

Pillar III: Statutory Governance & Civil Security

REGULATORY FRAMEWORK

GOVERNMENT

REGULATION DOCUMENT

PSIRA

- Private Security Industry Regulation Act 56 of 2001.
- Compliance with Section 23(6): Security Service Provider Registration.

OPERATIONAL SCOPE

- Policing Protocols: "Creative Law Response" & Community Policing.
- Specialized Training: Counter-Terrorism (Met Police Interest), VIP Protection, Crime Scene Management.

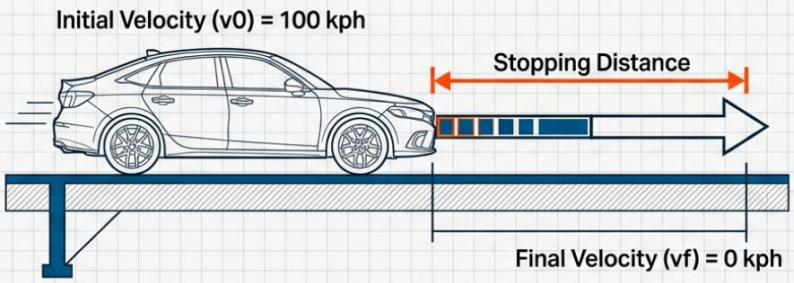
PHILOSOPHY

"Policing involves a proactive, problem-oriented approach to address the underlying causes of crime."

SLIDE 3 / 3: GOVERNANCE & SECURITY

NotebookLM

Public Safety Analytics: Traffic Management



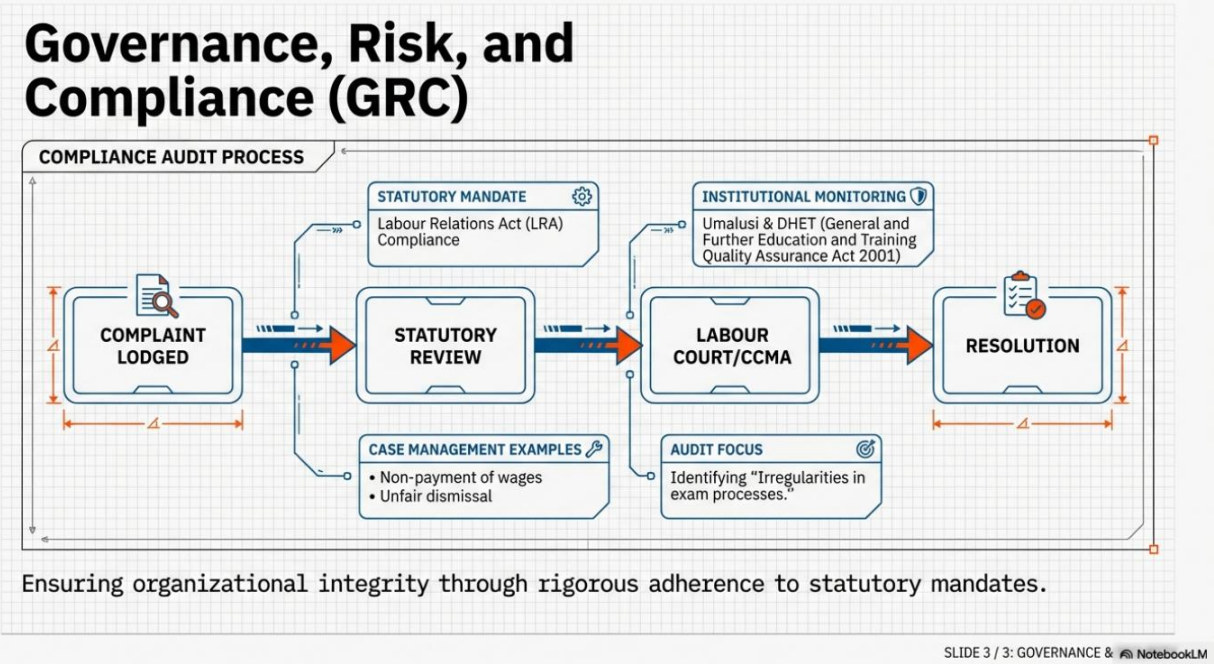
BRAKING PERFORMANCE DATA	
Vehicle:	Honda Civic / Subaru Specs
Metric:	100-0 kph Deceleration
Time:	2.77 seconds
Distance:	39 meters

CURRICULUM OBJECTIVES:

1. Vehicle Dynamics & ABS Analysis. →
2. Pedestrian Safety: "Energetic behavior on pavement" protocols.
3. Driver Defense: Blind spot management & clutch control.

SLIDE 3 / 3: TRAFFIC ANALYTICS

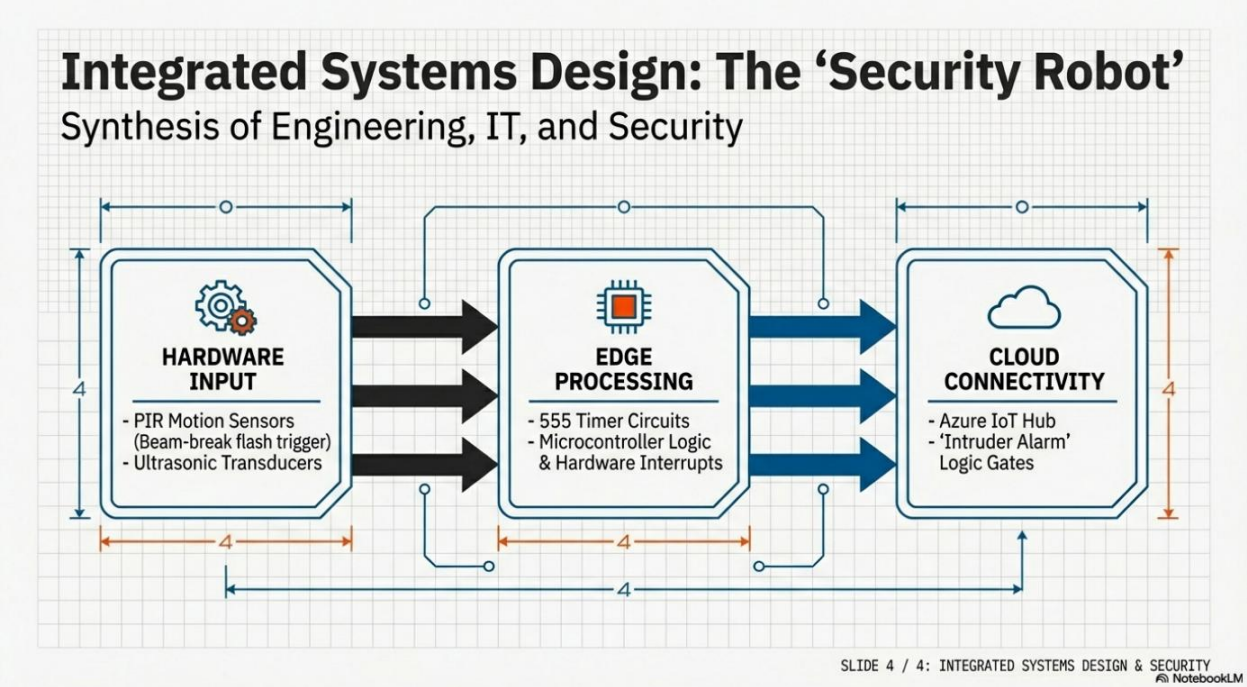
NotebookLM

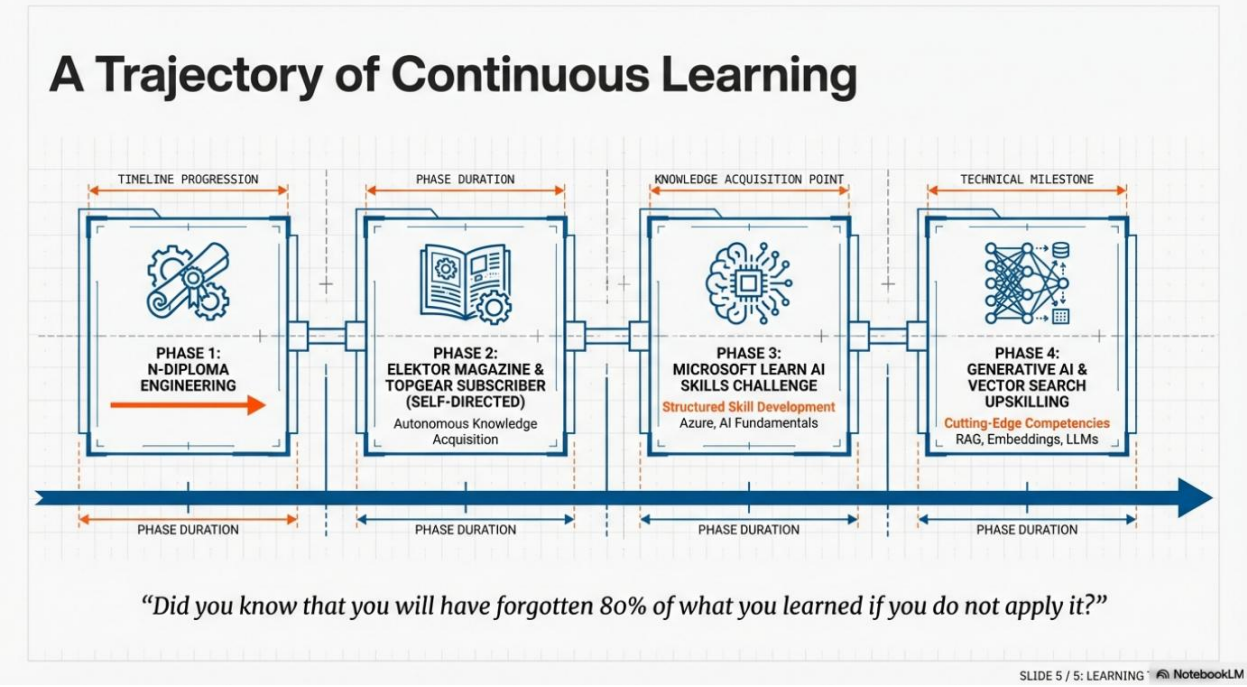


SLIDE 3 / 3: GOVERNANCE &

Educational Advocacy: The 'St Peace' Project
MISSION:
Establish a formalized 'National Trade Implementation' framework.
THE CHALLENGE:
Bridging the gap between 'experimental workplace industrial' training and formal SAQA/NQF accreditation.
STRATEGIC ACTION:
- Appeals to Department of Higher Education (DHET).
- IP Licensing requests for 'Thesis Master Engineering' curriculum.

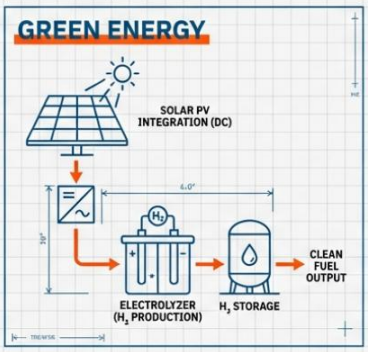
SLIDE 3 / 3: EDUCATION & ADVOCACY


Integrated Systems Design: The 'Security Robot'
Synthesis of Engineering, IT, and Security
HARDWARE INPUT
- PIR Motion Sensors (Beam-break flash trigger)
- Ultrasonic Transducers
EDGE PROCESSING
- 555 Timer Circuits
- Microcontroller Logic & Hardware Interrupts
CLOUD CONNECTIVITY
- Azure IoT Hub
- 'Intruder Alarm' Logic Gates
4
SLIDE 4 / 4: INTEGRATED SYSTEMS DESIGN & SECURITY
NotebookLM


A Trajectory of Continuous Learning
TIMELINE PROGRESSION
PHASE DURATION
KNOWLEDGE ACQUISITION POINT
TECHNICAL MILESTONE
PHASE 1: N-DIPLOMA ENGINEERING
PHASE 2: ELEKTOR MAGAZINE & TOPGEAR SUBSCRIBER (SELF-DIRECTED)
Autonomous Knowledge Acquisition
PHASE 3: MICROSOFT LEARN AI SKILLS CHALLENGE
Structured Skill Development
Azure, AI Fundamentals
PHASE 4: GENERATIVE AI & VECTOR SEARCH UPSKILLING
Cutting-Edge Competencies
RAG, Embeddings, LLMs
PHASE DURATION
PHASE DURATION
PHASE DURATION
PHASE DURATION
"Did you know that you will have forgotten 80% of what you learned if you do not apply it?"
SLIDE 5 / 5: LEARNING
NotebookLM

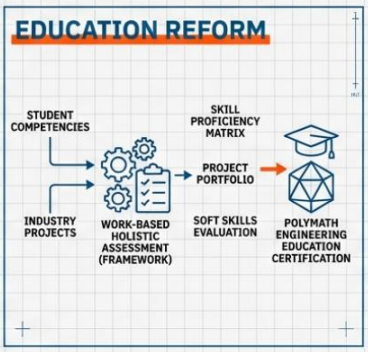
Future Vision: The ‘Thesis Master’ Proposal

National Trade Implementation Framework



IBM Plex Mono:
Hydrogen production & Solar PV Integration.

IBM Plex Mono:
Intelligence-Led Policing using Data Science & AI.



IBM Plex Mono:
Standardizing ‘Work-based Holistic Assessment’ for polymath engineering education.

SLIDE 6 / 6: FUTURE VISION & R&D FOCUS

NotebookLM

ENGINEERING. SECURITY. TECHNOLOGY.

Tshingombe Fiston (Tshitadi)
tshingombefiston@gmail.com
Johannesburg / Global

“At the heart of solutions to framework qualification and national trade implementation.’

NotebookLM

THE POLYMATH PORTFOLIO: ENGINEERING, LAW, AND EDUCATION SYSTEMS

A Comprehensive Digital Record of Research and Professional Practice

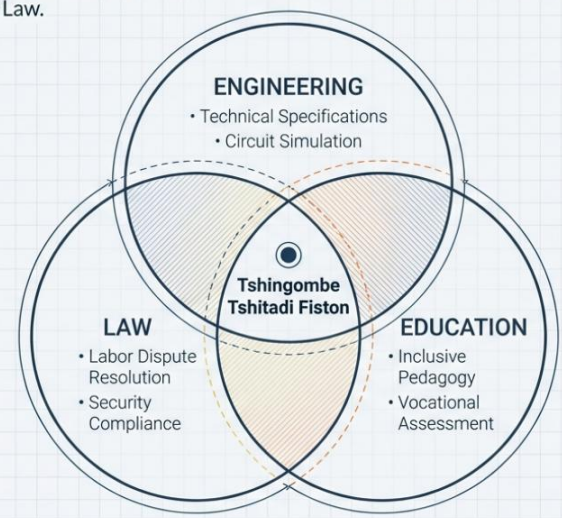
Subject: Tshingombe Tshitadi Fiston

DIGITAL NOTEBOOK AUDIT & CAREER ARCHITECTURE 2025

NotebookLM

THE PROFESSIONAL NEXUS

A synthesized career framework converging at the intersection of Advanced Engineering, Educational Assessment, and Regulatory Law.



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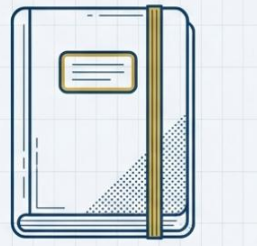
THE INTEGRATED ECOSYSTEM

1. ENGINEERING QUALIFICATIONS Higher Education Curricula (AIU, St Peace College)	**2. TECHNICAL TRADE THEORY** Electrical foundations and framework automation.
3. REGULATORY FRAMEWORKS Labor relations, trade unions, and legal nexus points.	**4. CAREER ANALYTICS** Auditing, vocational credential resilience, and performance tracking.

NotebookLM



PILLAR 1: ADVANCED ENGINEERING & DESIGN

Credentialed Frameworks and Technical Documentation

- **Key Institutions:** Atlantic International University (AIU), St Peace College, DHET, SAQA.
- **Focus Area 1:** Electrical Engineering Master Curriculum.
- **Focus Area 2:** Circuit simulations and Design Engineering Studies.
- **Metrics:** Power factor, fault currents, and efficiency optimization.

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PILLAR 2: THE REGULATORY & LABOR NEXUS

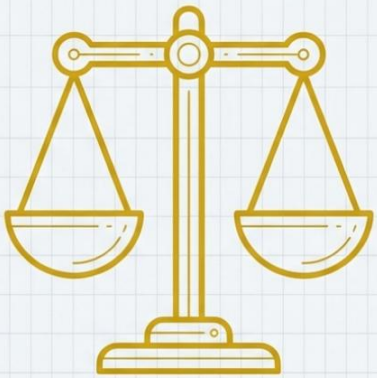
Dispute Resolution, Safety Policy, and Union Bargaining

KEY ENTITIES

- **CCMA:** Council for Conciliation, Mediation and Arbitration
- **PSiRA & SAPS:** Security Sector / Policy Defense Safety

CORE COMPETENCIES

- Labor Dispute Portfolio (Court & Award Certificate matters)
- Trade Union bargaining and compliance
- Occupational Health and Safety Act (OHSA) & LRA GN rules



Drafting Blue

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PILLAR 2: THE REGULATORY & LABOR NEXUS

Dispute Resolution, Safety Policy, and Union Bargaining

KEY ENTITIES

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- Trade Union bargaining and compliance
- Occupational Health and Safety Act (OHSA) & LRA GN rules

Drafting Blue

NotebookLM

METHODOLOGY OF VERIFICATION

The Digital Notebook System

GOOGLE CLASSROOM

Course completion and curriculum tracking.

KLM LEARNING

Aviation safety and corporate compliance.

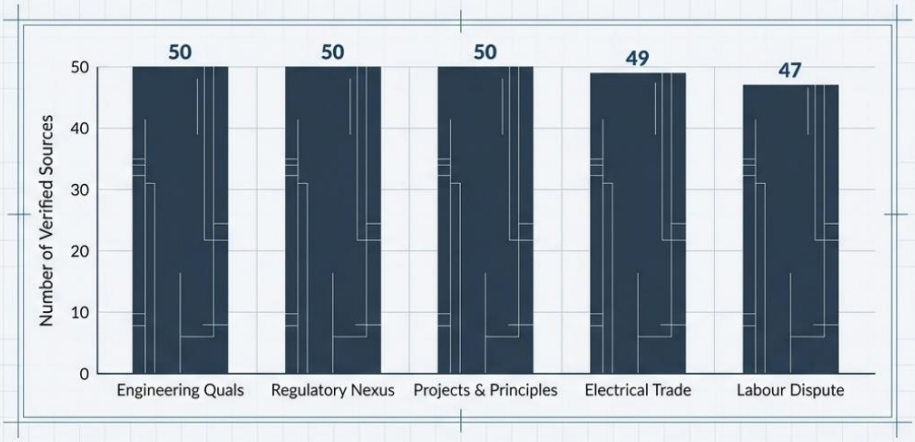
BLOGGER

Portfolio evidence and technical communication.

Architectural Dossier

NotebookLM

RESEARCH DEPTH & DATA METRICS



Consistent depth of inquiry across technical and legal disciplines (47-50 sources per volume).

Drafting Blus

Architectural Dossier Lato Regular

16:9 Lato Regular

NotebookLM

TANGIBLE DELIVERABLES

Translating Theory into Professional Artifacts

Calculation Logs

Cost analysis and calculus models.

Decision Trees

Risk analysis and labor dispute resolution paths.

Compliance Matrices

Alignment with SABS/OHSA rules.

Dashboards

VBA dashboards and CPD-ready artifacts.

Architectural Dossier

16:9

NotebookLM

INTERSECTIONALITY CASE STUDY

Engineering Functions & Crime System Architecture

TECHNICAL DESIGN PRINCIPLES

SECURITY & LEGAL SECTORS

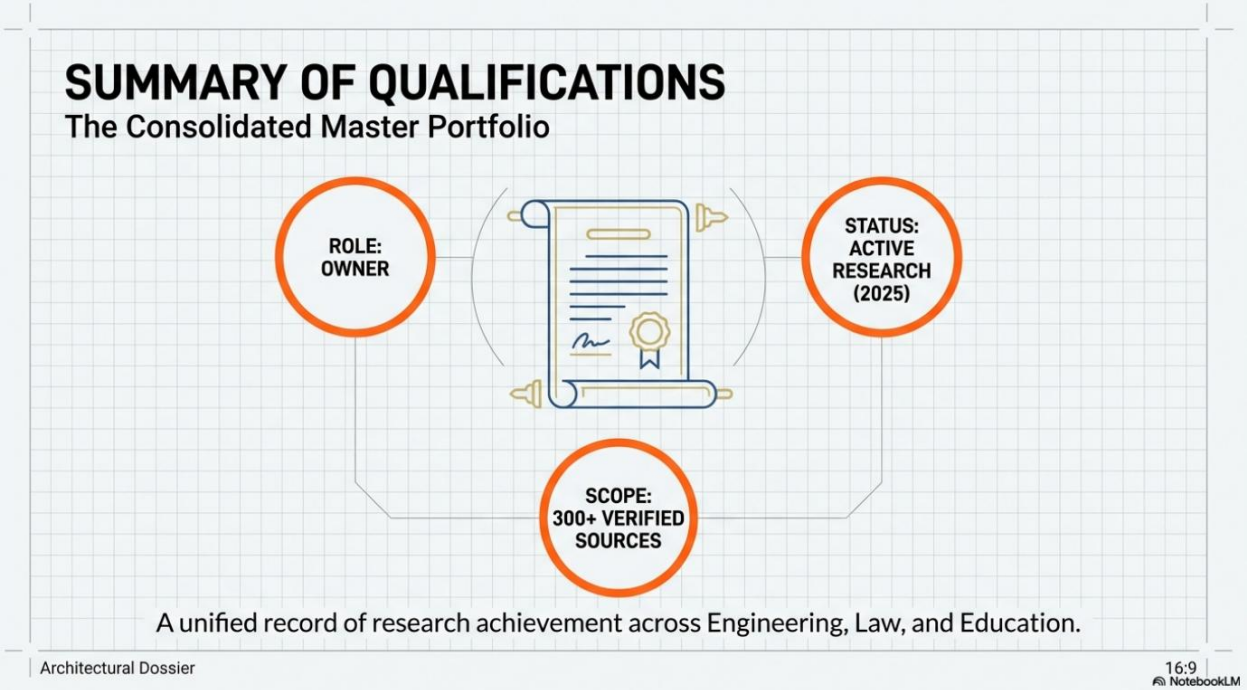
EVIDENCE BASE

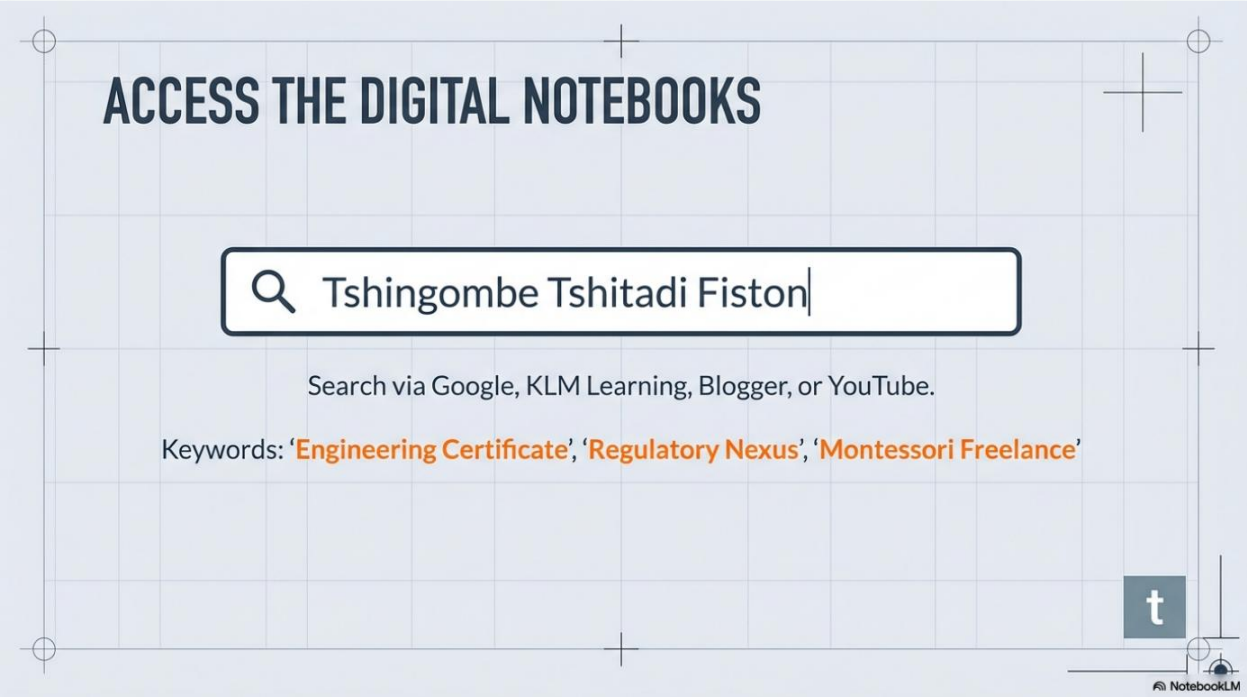
- Notebook: "Data Forms, Engineering Functions, and Crime System Architecture" (50 Sources)
- Notebook: "Labour Dispute Portfolio... Security Sector/Policy Defense Safety"

Designing systems that are electrically sound, legally compliant, and secure.

NotebookLM

DIGITAL FOOTPRINT & CREDENTIAL AUDIT
Verification Across Global Platforms
MICROSOFT LEARN
Role-based certifications (Azure Administrator, Power BI) & Transcripts.
LINKEDIN ANALYTICS
Content Performance Analytics and Vocational Credential Resilience.
YOUTUBE CONTENT
Proof of communication skills and technical content creation.
Architectural Dossier
16:9
NotebookLM


SUMMARY OF QUALIFICATIONS
The Consolidated Master Portfolio
ROLE: OWNER
STATUS: ACTIVE RESEARCH (2025)
SCOPE: 300+ VERIFIED SOURCES
A unified record of research achievement across Engineering, Law, and Education.
Architectural Dossier
16:9
NotebookLM


ACCESS THE DIGITAL NOTEBOOKS
Tshingombe Tshitadi Fiston
Search via Google, KLM Learning, Blogger, or YouTube.
Keywords: 'Engineering Certificate', 'Regulatory Nexus', 'Montessori Freelance'
t
NotebookLM

The Technical & Regulatory Nexus

A Multidisciplinary Portfolio: Engineering Systems | Legal Compliance | Vocational Education

Tshingombe Tshitadi Fiston

Integrated Professional Framework 2025

NotebookLM

Tshingombe Tshitadi Fiston

Architect of Credentialed Engineering Frameworks

The Ecosystem Model

True technical success requires the integration of trade skills, rule of law, and continuous assessment.

Advanced Engineering

Hard Skills: Electrical & Mechanical Systems

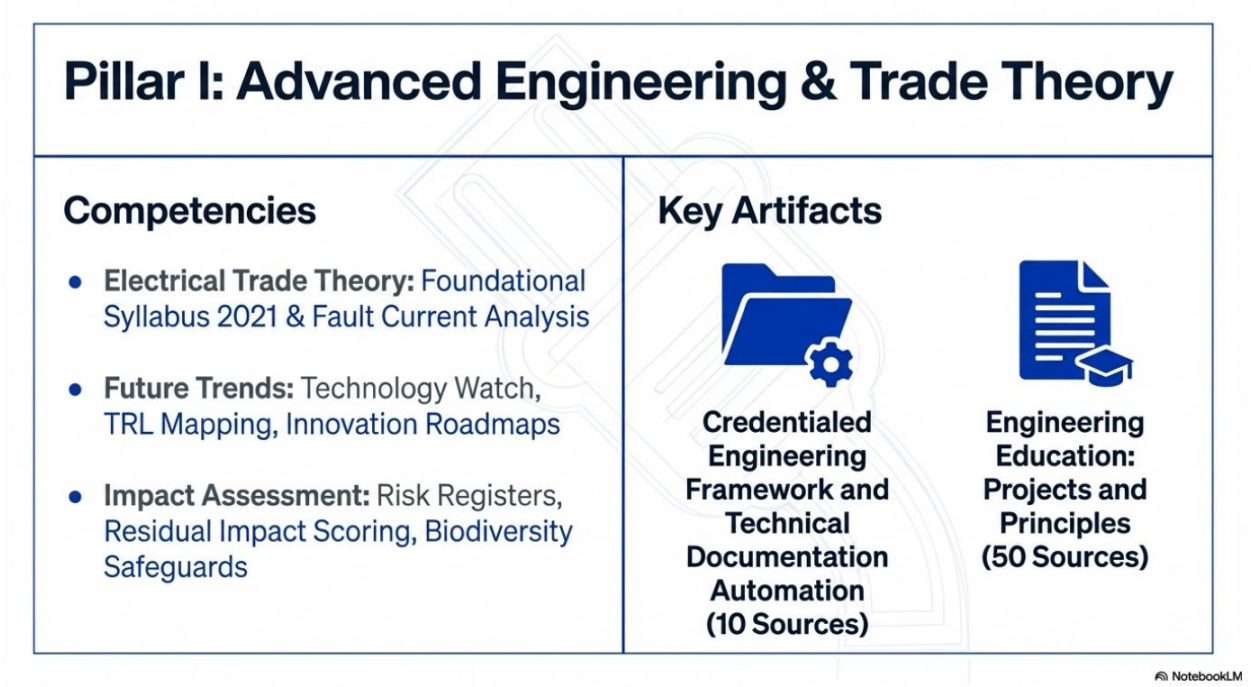
Regulatory Frameworks

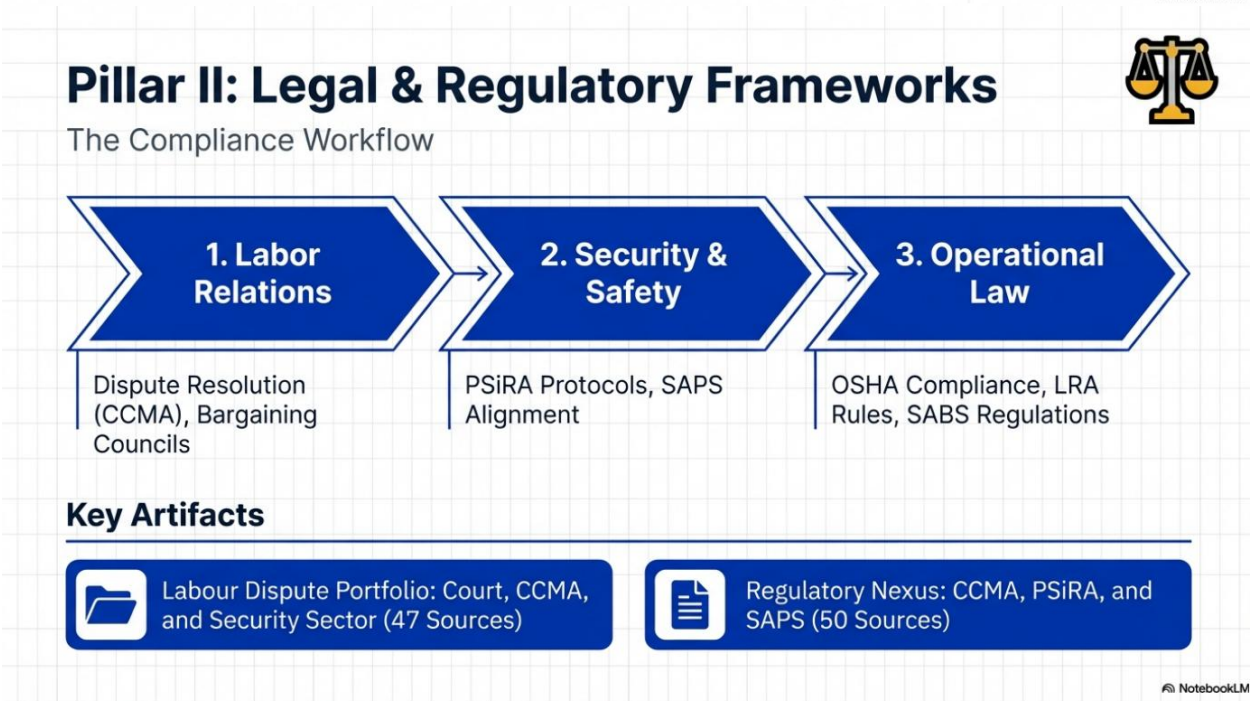
Soft Infrastructure: Labor Law & Procurement

Educational Assessment

Vocational Evaluation (SAQA/NQF)

NotebookLM


Pillar I: Advanced Engineering & Trade Theory
Competencies
Electrical Trade Theory: Foundational Syllabus 2021 & Fault Current Analysis
Future Trends: Technology Watch, TRL Mapping, Innovation Roadmaps
Impact Assessment: Risk Registers, Residual Impact Scoring, Biodiversity Safeguards
Key Artifacts
Credentialed Engineering Framework and Technical Documentation Automation (10 Sources)
Engineering Education: Projects and Principles (50 Sources)
NotebookLM


Pillar II: Legal & Regulatory Frameworks
The Compliance Workflow
1. Labor Relations
2. Security & Safety
3. Operational Law
Dispute Resolution (CCMA), Bargaining Councils
PSiRA Protocols, SAPS Alignment
OSHA Compliance, LRA Rules, SABS Regulations
Key Artifacts
Labour Dispute Portfolio: Court, CCMA, and Security Sector (47 Sources)
Regulatory Nexus: CCMA, PSiRA, and SAPS (50 Sources)
NotebookLM

Pillar III: Pedagogy & Curriculum Architecture

Inclusive Design

- Montessori Methods
- Braille Certification
- Accessible Learning Models

Standards & Quality

- DHET Alignment
- QCTO Specifications
- SAQA/NQF Frameworks

Assessment Delivery

- Inclusive Assessment Architectures
- Certification Backlog Remediation
- Google Classroom Proficiency

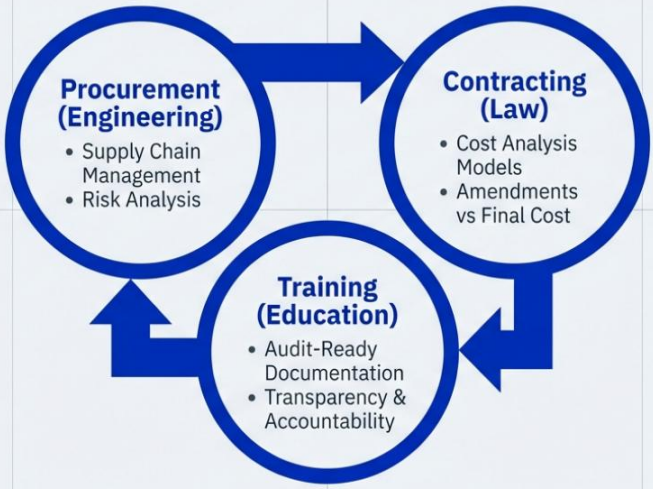
Key Artifacts

- National Qualification in Design Engineering Studies (St Peace College/AIU)
- Career Material in Didactic Experimental Education

NotebookLM

The Integrated Career Framework

Synthesizing Wholesaler Trade & Financial Freelancing



"Financial freelancing and wholesaler trade can be integrated into modern engineering pathways."

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Digital Proficiency & Analytics Dashboard

Platform Mastery

- LMS: Google Classroom Fundamentals, KLM Learning
- Content Management: Blogger (Content Policy & Compliance), YouTube Creator Academy
- Data Tools: Microsoft Azure, Power BI Data Analyst

Performance Metrics

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The Research Archive: Verified Knowledge Base

High-Density Research Notebooks (2025)

Engineering: Certified Record of Research Achievement
(50 Sources)

Engineering: Electrical Master Curriculum
(AIU)

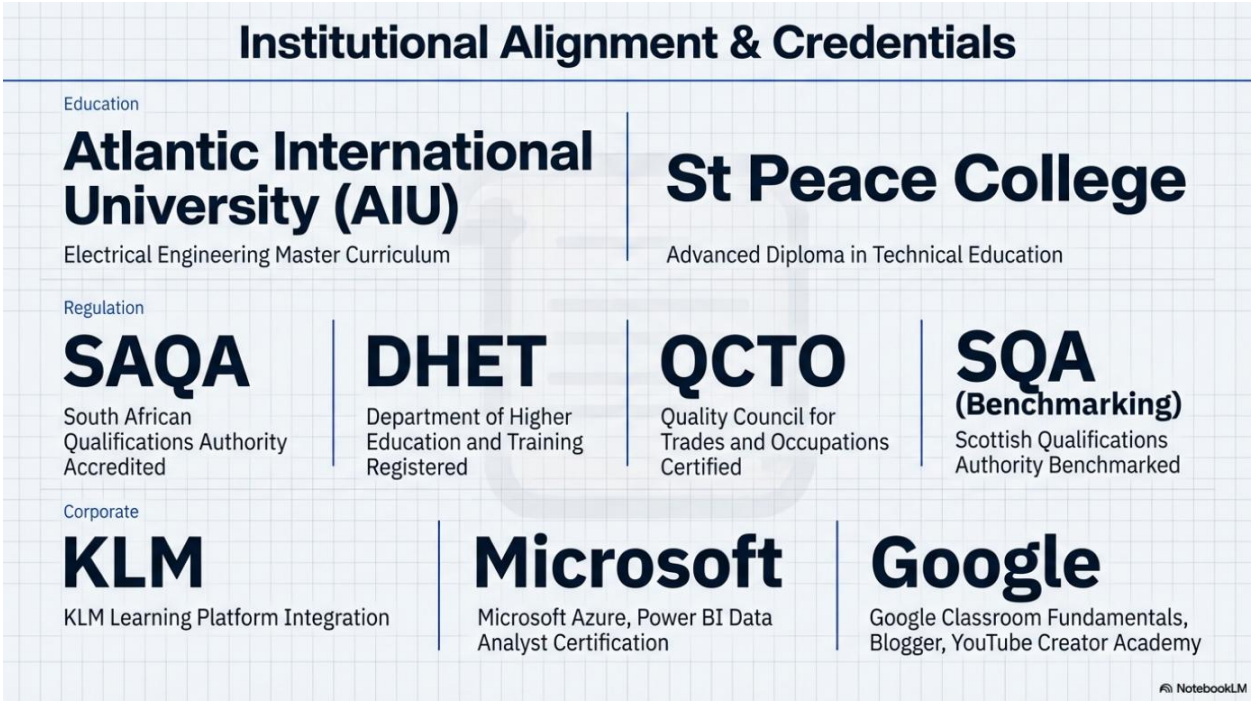
Legal: Crime System Architecture
(50 Sources)

Legal: Trade Union Working & Bargaining

Education: Projects and Principles
(50 Sources)

Education: National Qualification in Design Engineering

NotebookLM


Institutional Alignment & Credentials
Education
Atlantic International University (AIU)
Electrical Engineering Master Curriculum
St Peace College
Advanced Diploma in Technical Education
Regulation
SAQA
South African Qualifications Authority Accredited
DHET
Department of Higher Education and Training Registered
QCTO
Quality Council for Trades and Occupations Certified
SQA (Benchmarking)
Scottish Qualifications Authority Benchmarked
Corporate
KLM
KLM Learning Platform Integration
Microsoft
Microsoft Azure, Power BI Data Analyst Certification
Google
Google Classroom Fundamentals, Blogger, YouTube Creator Academy
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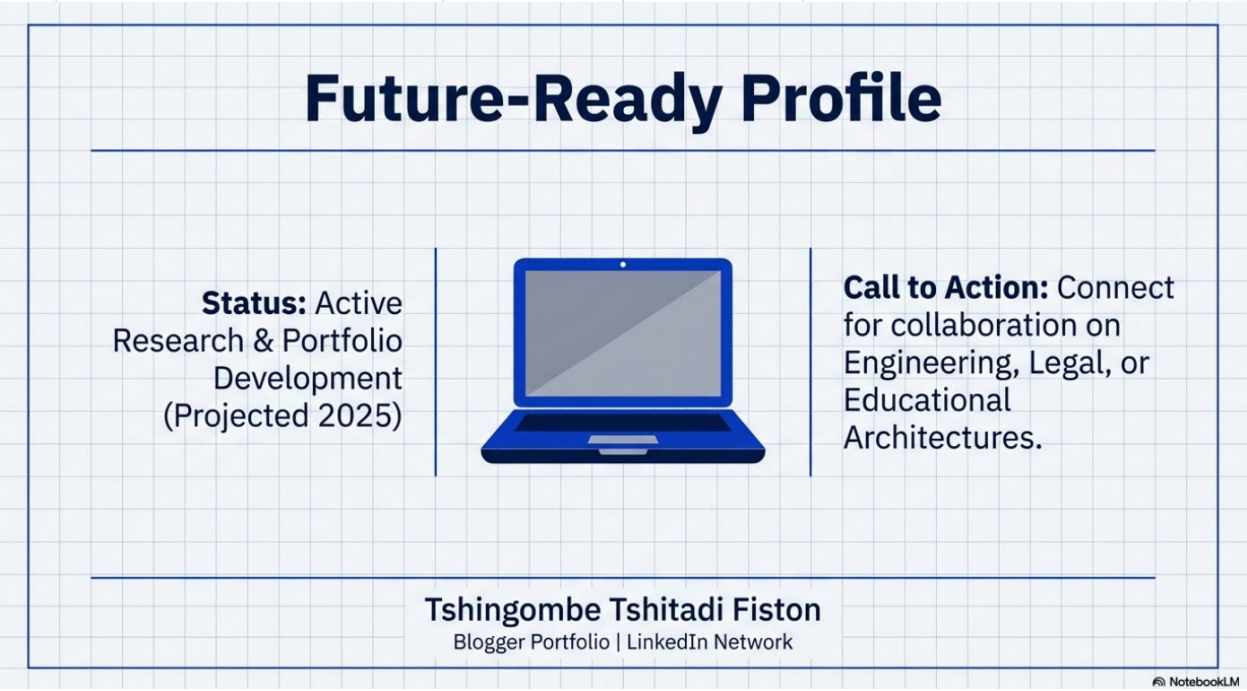
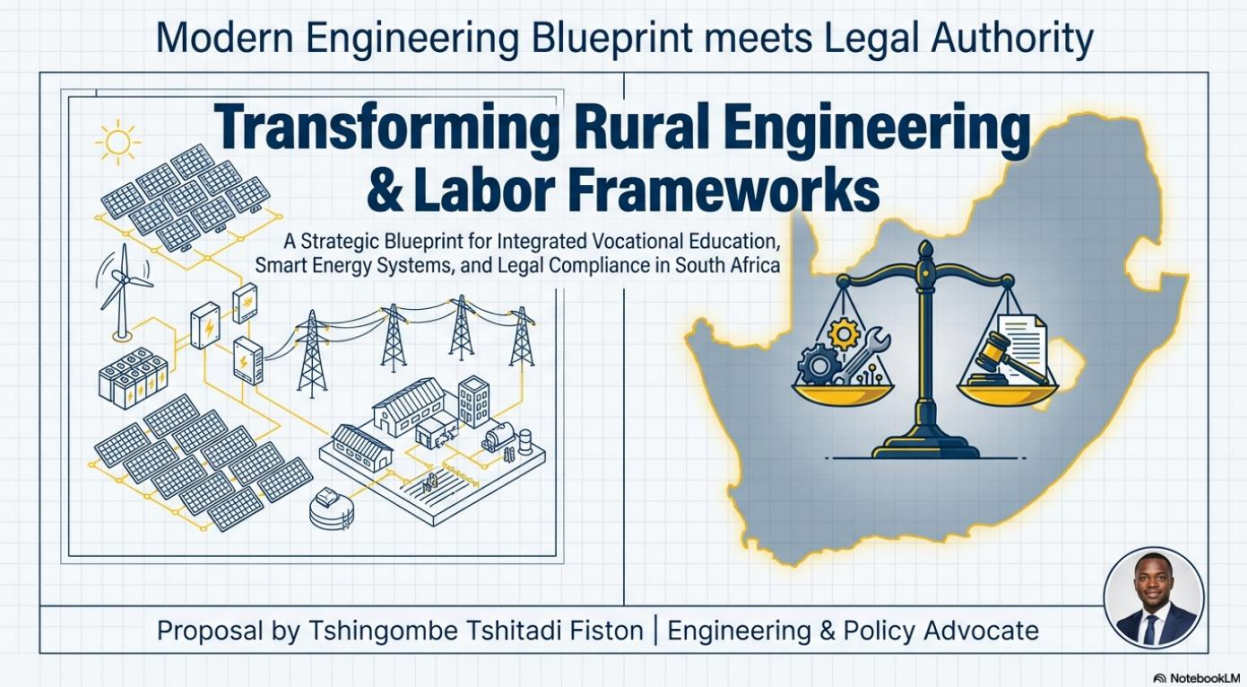
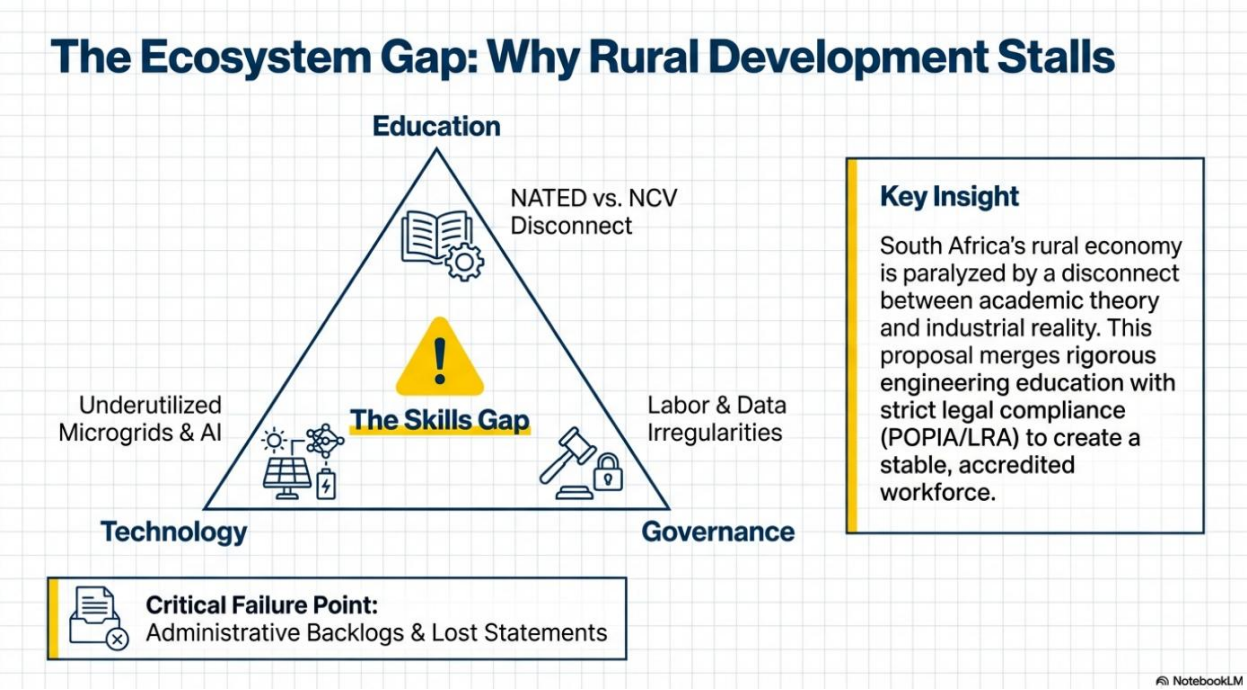
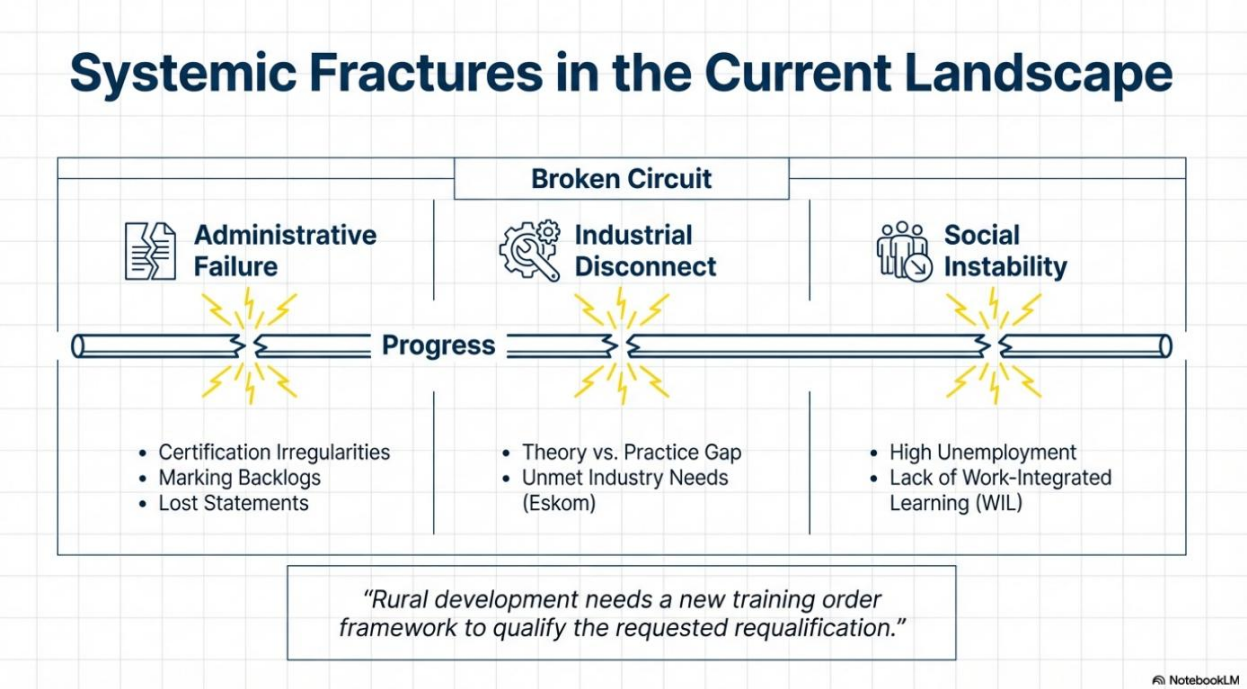
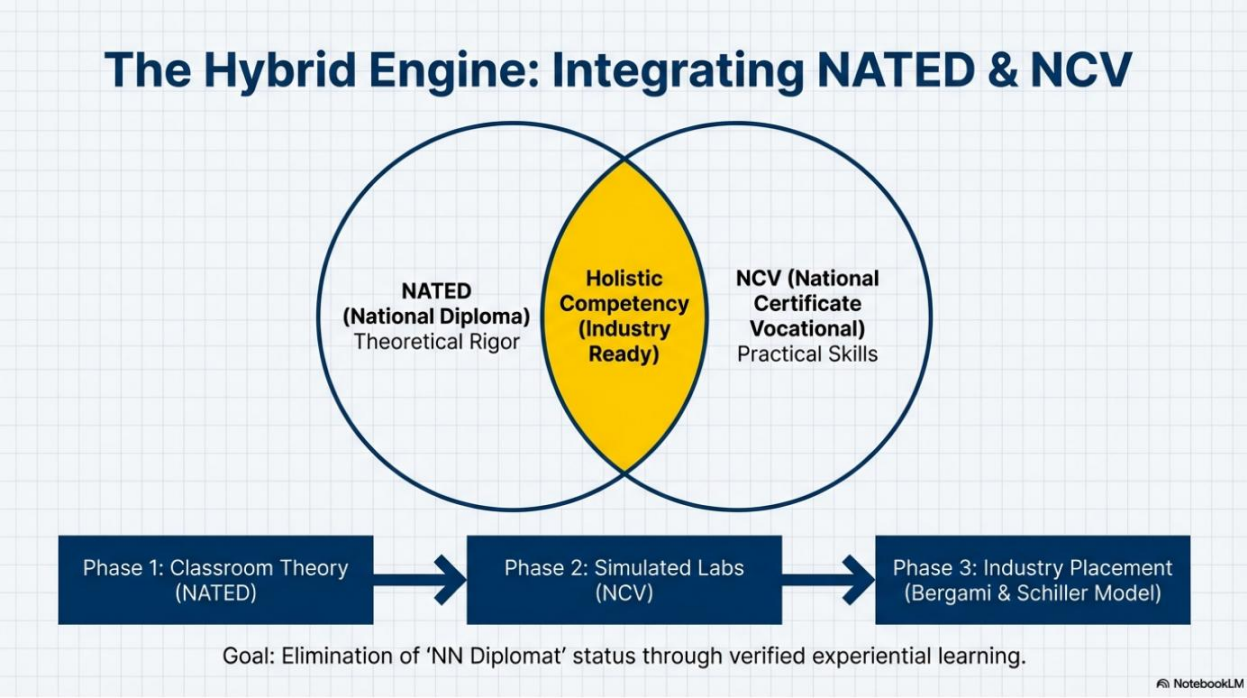
The Technical & Regulatory Nexus
A Multidisciplinary Portfolio: Engineering Systems | Legal Compliance | Vocational Education
Tshingombe Tshitadi Fiston
Integrated Professional Framework 2025
NotebookLM


Future-Ready Profile
Status: Active Research & Portfolio Development (Projected 2025)
Call to Action: Connect for collaboration on Engineering, Legal, or Educational Architectures.
Tshingombe Tshitadi Fiston
Blogger Portfolio | LinkedIn Network
NotebookLM


Modern Engineering Blueprint meets Legal Authority
Transforming Rural Engineering & Labor Frameworks
A Strategic Blueprint for Integrated Vocational Education, Smart Energy Systems, and Legal Compliance in South Africa
Proposal by Tshingombe Tshitadi Fiston | Engineering & Policy Advocate
NotebookLM


The Ecosystem Gap: Why Rural Development Stalls
Education
NATED vs. NCV Disconnect
The Skills Gap
Underutilized Microgrids & AI
Labor & Data Irregularities
Technology
Governance
Key Insight
South Africa's rural economy is paralyzed by a disconnect between academic theory and industrial reality. This proposal merges rigorous engineering education with strict legal compliance (POPIA/LRA) to create a stable, accredited workforce.
Critical Failure Point:
Administrative Backlogs & Lost Statements
NotebookLM


Systemic Fractures in the Current Landscape
Broken Circuit
Administrative Failure
Industrial Disconnect
Social Instability
Progress
• Certification Irregularities
• Marking Backlogs
• Lost Statements
• Theory vs. Practice Gap
• Unmet Industry Needs (Eskom)
• High Unemployment
• Lack of Work-Integrated Learning (WIL)
"Rural development needs a new training order framework to qualify the requested requalification."
NotebookLM


The Hybrid Engine: Integrating NATED & NCV
NATED (National Diploma) Theoretical Rigor
Holistic Competency (Industry Ready)
NCV (National Certificate Vocational) Practical Skills
Phase 1: Classroom Theory (NATED)
Phase 2: Simulated Labs (NCV)
Phase 3: Industry Placement (Bergami & Schiller Model)
Goal: Elimination of 'NN Diplomat' status through verified experiential learning.
NotebookLM

Curriculum Modernization: Engineering for the Future

Power Systems

- Microgrids
- Renewable Optimization
- Battery Storage

Automation & AI

- Neural Networks
- Robotics
- IoT Smart Home

Telecoms

- 5G/6G Networks
- Signal Processing
- Optical Fibre

Target Industries Eskom SIEMENS City Power

NotebookLM

Bridging the Gap: Work-Integrated Learning (WIL)

College Theory
Foundation in Math/Science (N3-N6)

Simulation
Virtual Labs & Experiential Learning

Placement
Industry Placement (Bergami & Schiller Model)

Certification
Portfolio of Evidence & Log Books

Strategy: Bridging the gap between 'College' and 'Company' through monitored mentorship and distinct 'Log Books' to prevent irregularities.

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Information Governance & POPIA Compliance

Compliance Protocol

- Appointment of Information Officer (Registered with Regulator).
- Lawful Processing of Personal Information (ID, Biometrics, History).
- Mandatory Breach Notification & Security Protocols.
- Maintenance of Records of Processing Activities.

Modernizing Management Information Systems (MIS) to protect Data Subject Rights.

Target Industries

Eskom SIEMENS City Power

NotebookLM

Industrial Stability: Labor Relations & Dispute Resolution

Key Institutions

Bargaining Councils (NBCPSS) & Trade Unions.

Dispute Resolution Process

Internal Grievance Procedure

↓

CCMA (Commission for Concilriation, Mediation and Arbitration)

↓

Labour Court / Labour Appeal Court

Compliance Areas

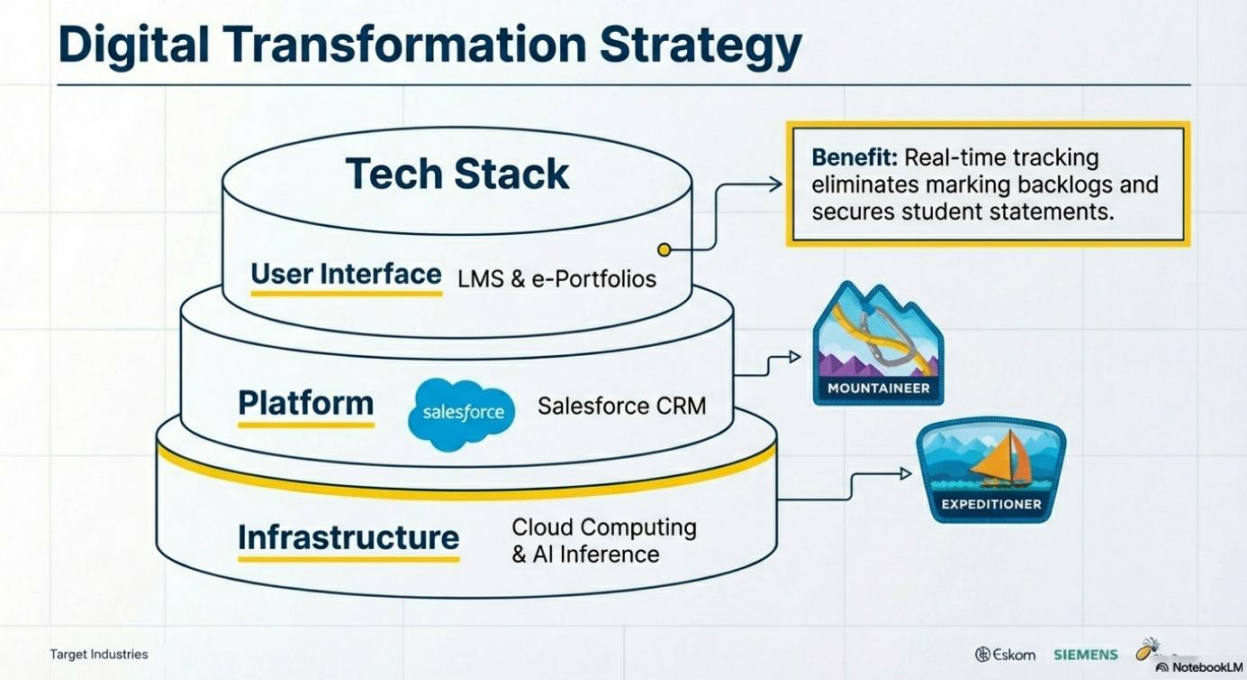
Unfair Dismissals, Retrenchments, COID (Injury Compensation), & UIF.

Target Industries

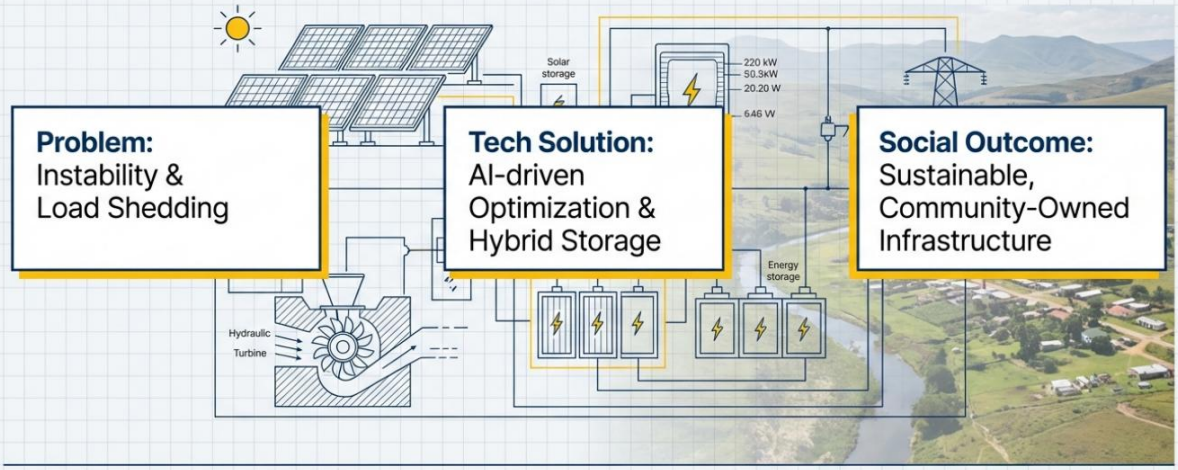
Eskom SIEMENS

NotebookLM

Workplace Safety & Human Rights Framework
Domestic Violence Act 116
Requires a Domestic Relationship
Covers physical, sexual, and economic abuse
Protects household and family members
Protection from Harassment Act 17
No relationship required
Covers stalking and unwanted contact
Includes digital harassment and psychological harm
Activism Row FESTIVAL
Policy: Zero tolerance for harassment in training centers to ensure Psychological Safety.
Target Industries
Eskom
SIEMENS
NotebookLM


Digital Transformation Strategy
Tech Stack
User Interface
LMS & e-Portfolios
Platform
salesforce
Salesforce CRM
Infrastructure
Cloud Computing & AI Inference
Benefit: Real-time tracking eliminates marking backlogs and secures student statements.
MOUNTAINEER
EXPEDITIONER
Target Industries
Eskom
SIEMENS
NotebookLM

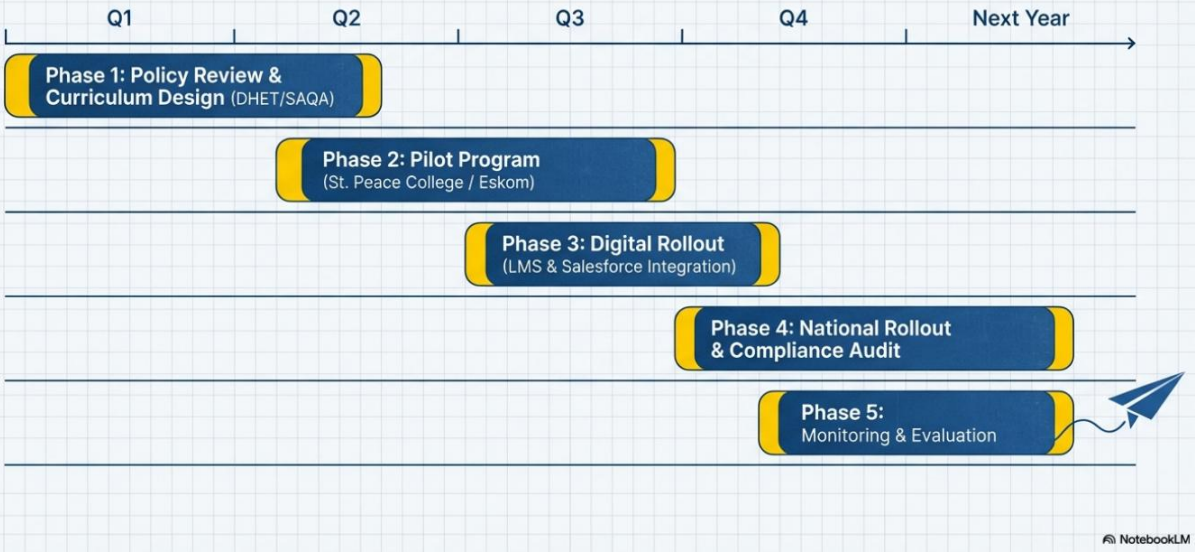
Case Study: Rural Microgrid Optimization



Project: Optimization of Microgrid Systems.

Eskom SIEMENS City Power NotebookLM

Strategic Roadmap: From Policy to Practice


Q1
Q2
Q3
Q4
Next Year
Phase 1: Policy Review & Curriculum Design (DHET/SAQA)
Phase 2: Pilot Program (St. Peace College / Eskom)
Phase 3: Digital Rollout (LMS & Salesforce Integration)
Phase 4: National Rollout & Compliance Audit
Phase 5: Monitoring & Evaluation

NotebookLM

Call to Action & Strategic Partnerships

Government
Department of Justice
DHET
Dept of Labour

Ratification & Policy

Regulatory
SAQA
ECSA
CCMA

Accreditation & Compliance

Immediate Needs: Grant Review, Experimental Facility Funding, and Policy Ratification.

Industry
Eskom
Siemens
City Power

Placements & Equipment

Funding
National Skills Fund (NSF)
Private Grants

Capital & Facilities

Project: Optimization of Microgrid Systems. Inter

Eskom SIEMENS

NotebookLM

Justice, Skills, and Energy

The pillars of a new South African Economy.

Tshingombe Tshitadi Fiston

Engineering & Policy Advocate | Trailblazer

tshingombefiston@gmail.com

0725298946

salesforce

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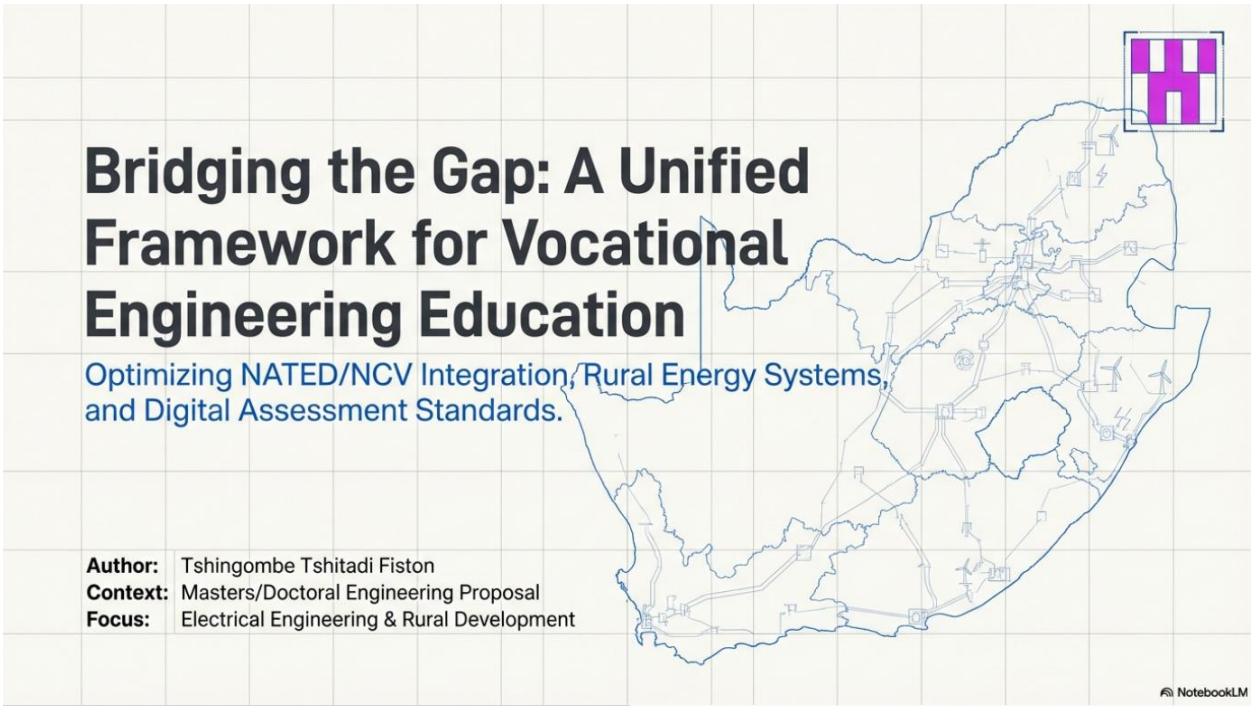
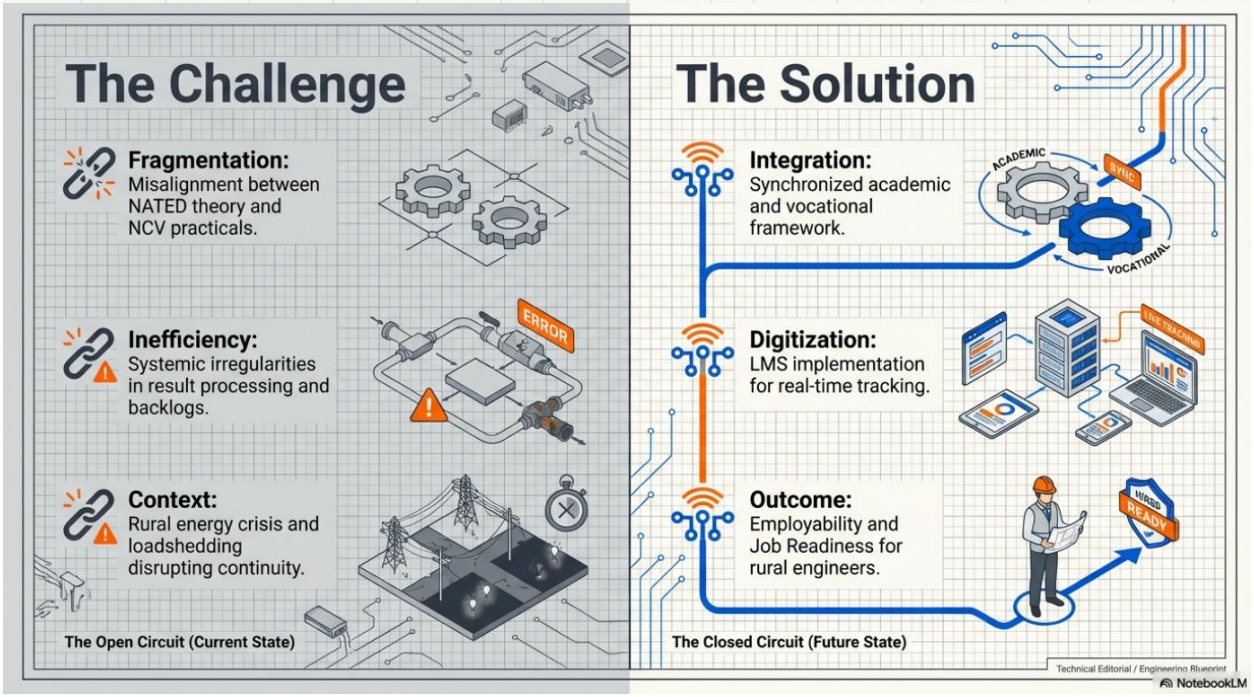
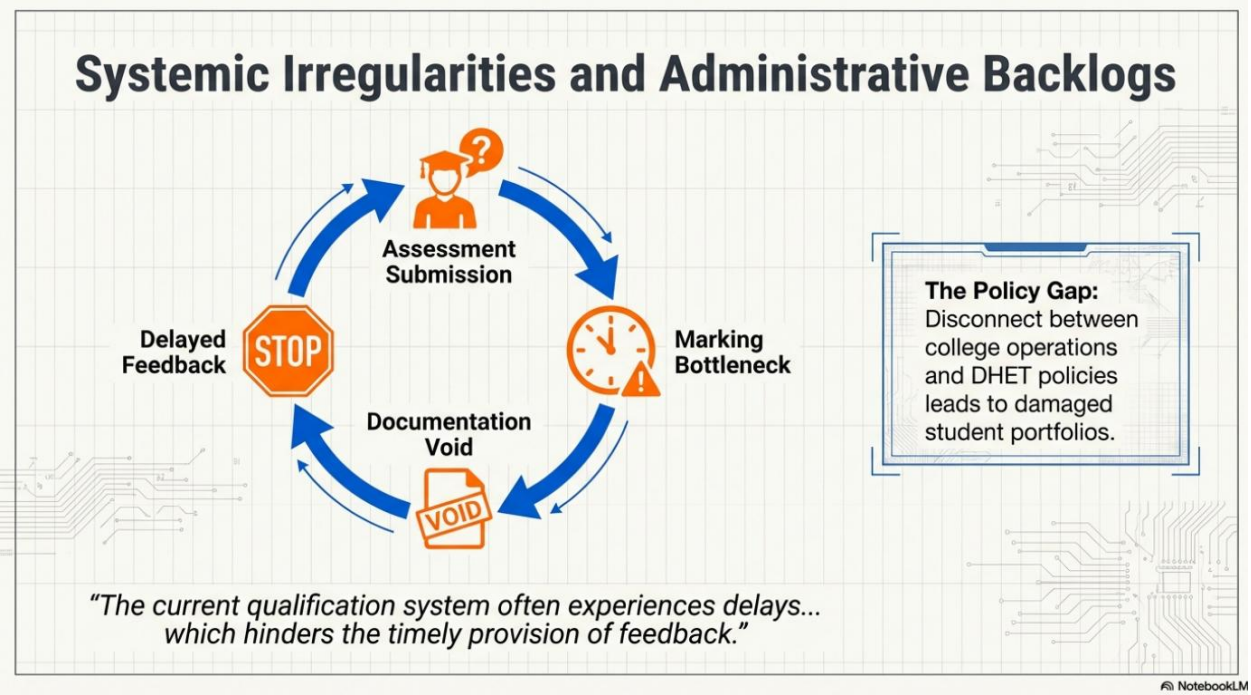
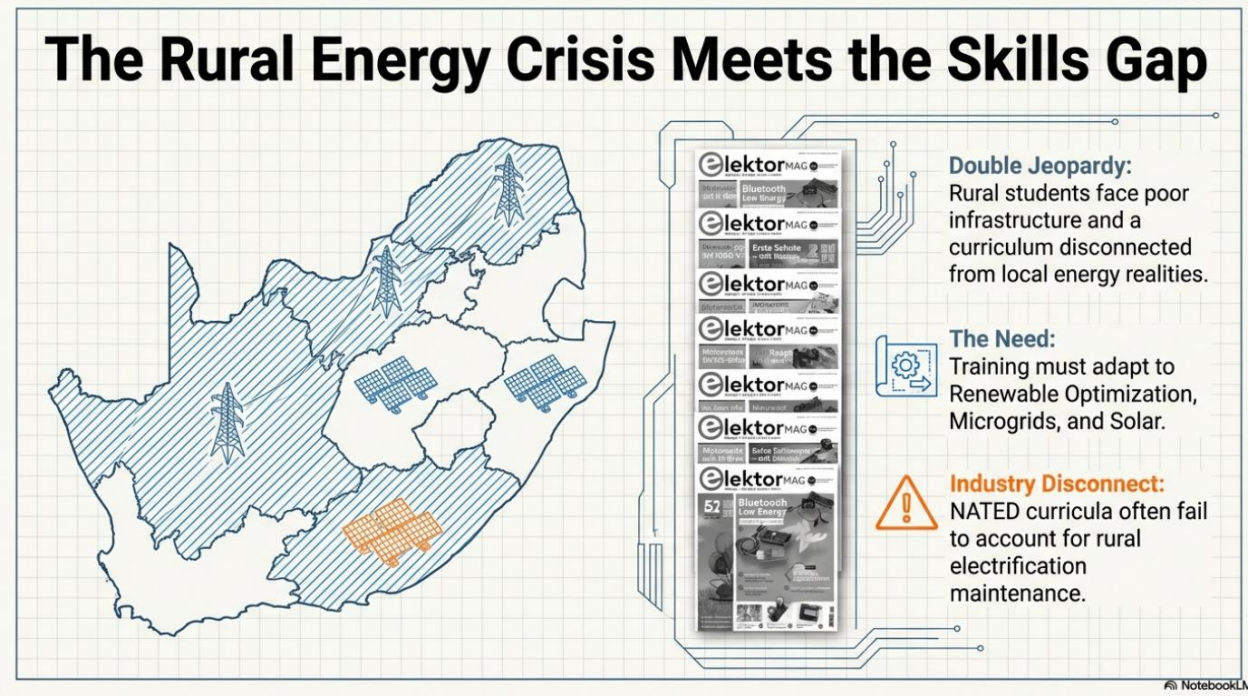
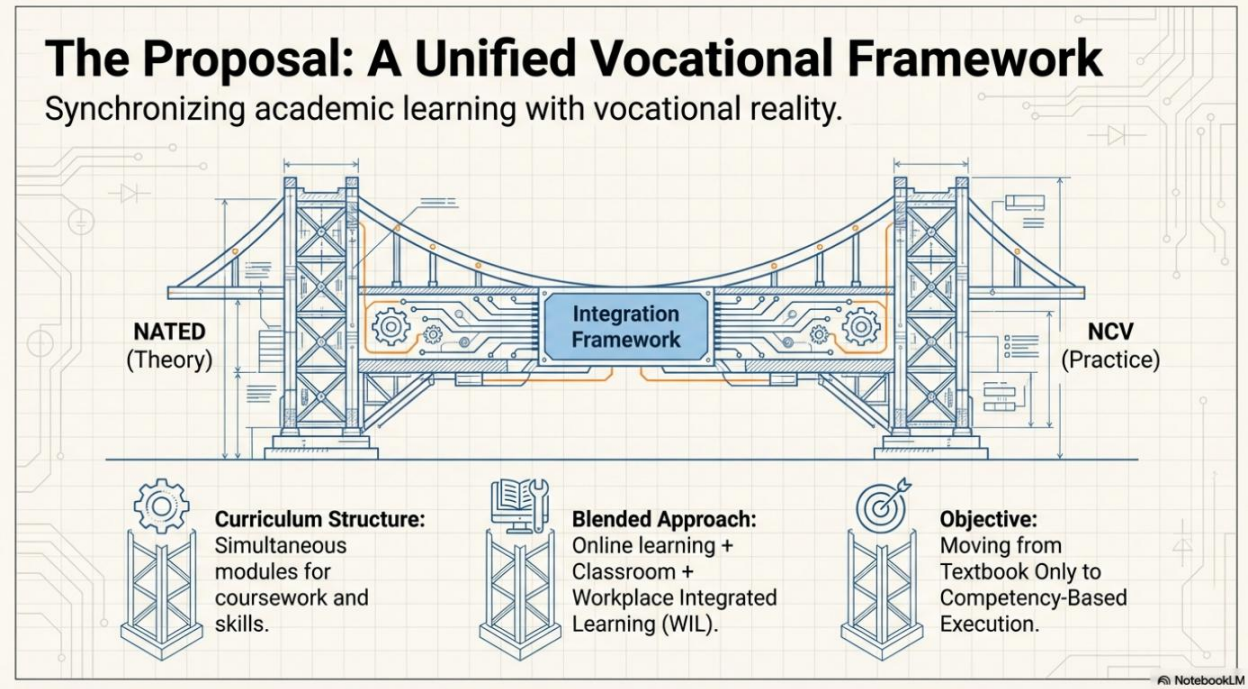
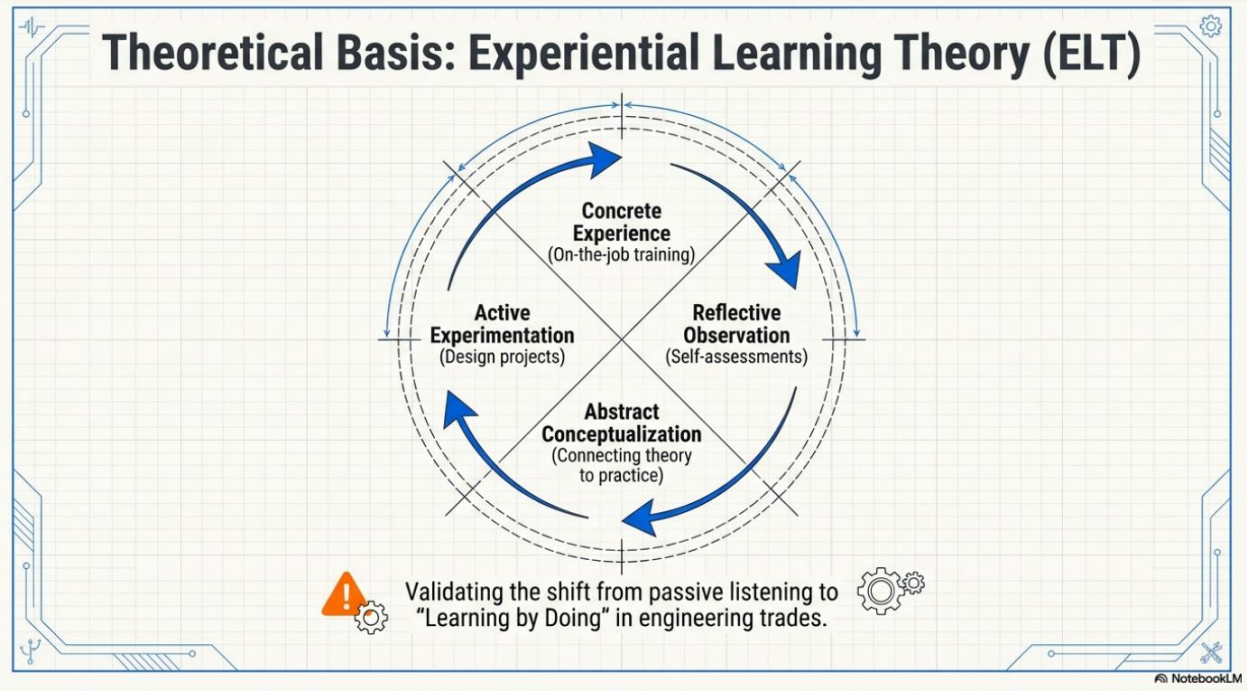

Bridging the Gap: A Unified Framework for Vocational Engineering Education
Optimizing NATED/NCV Integration, Rural Energy Systems, and Digital Assessment Standards.
Author: Tshingombe Tshitadi Fiston
Context: Masters/Doctoral Engineering Proposal
Focus: Electrical Engineering & Rural Development
NotebookLM

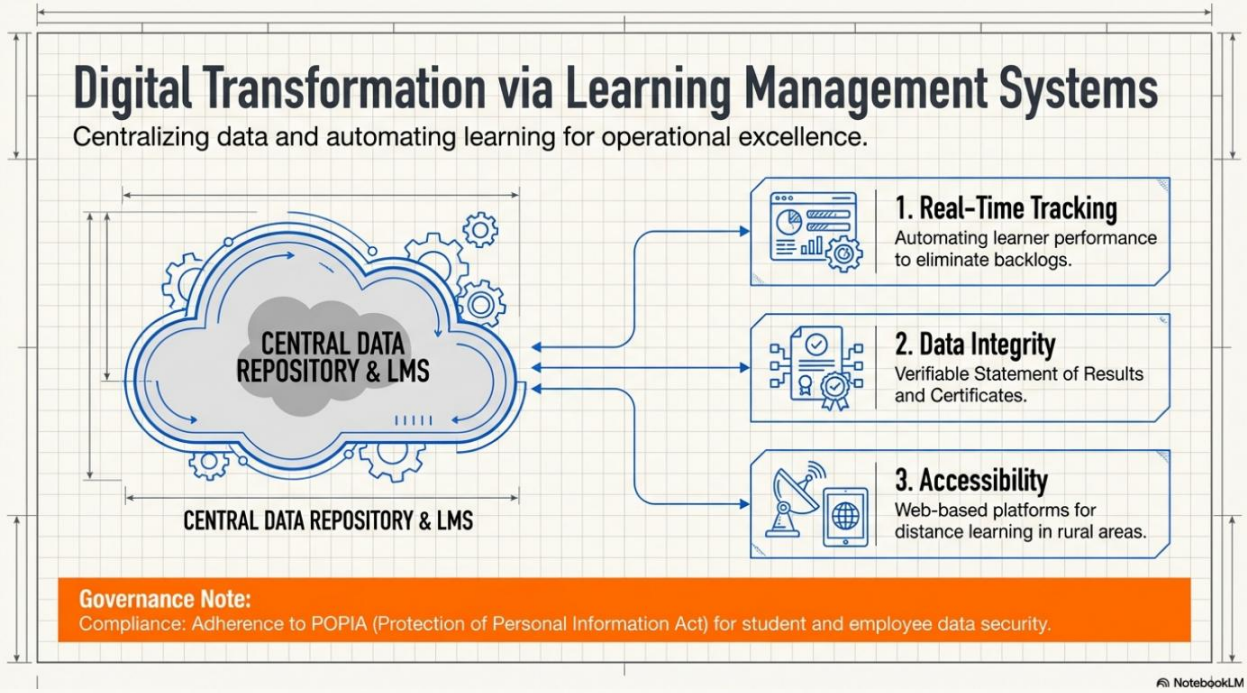

The Challenge
Fragmentation: Misalignment between NATED theory and NCV practicals.
Inefficiency: Systemic irregularities in result processing and backlogs.
ERROR
Context: Rural energy crisis and loadshedding disrupting continuity.
The Open Circuit (Current State)
The Solution
Integration: Synchronized academic and vocational framework.
ACADEMIC
SYNC
VOCATIONAL
Digitization: LMS implementation for real-time tracking.
Outcome: Employability and Job Readiness for rural engineers.
WORLD READY
The Closed Circuit (Future State)
Technical Editorial / Engineering Blueprint
NotebookLM

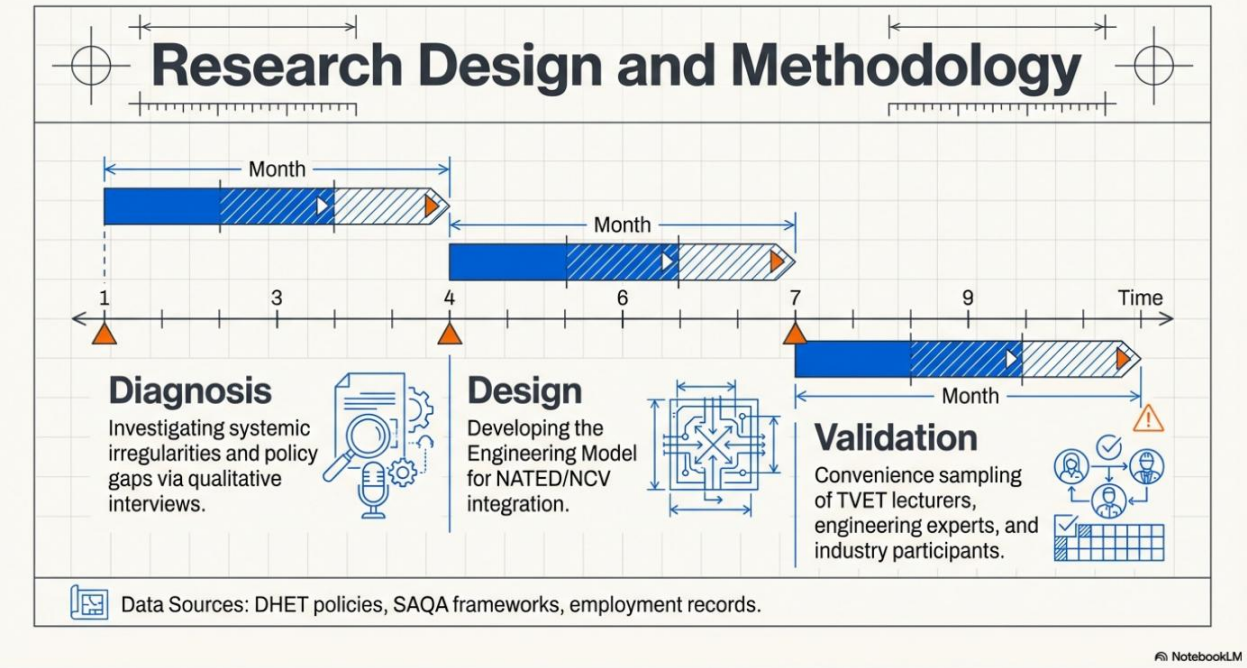

Systemic Irregularities and Administrative Backlogs
Assessment Submission
Marking Bottleneck
Documentation Void
Delayed Feedback
STOP
VOID
The Policy Gap: Disconnect between college operations and DHET policies leads to damaged student portfolios.
"The current qualification system often experiences delays... which hinders the timely provision of feedback."
NotebookLM

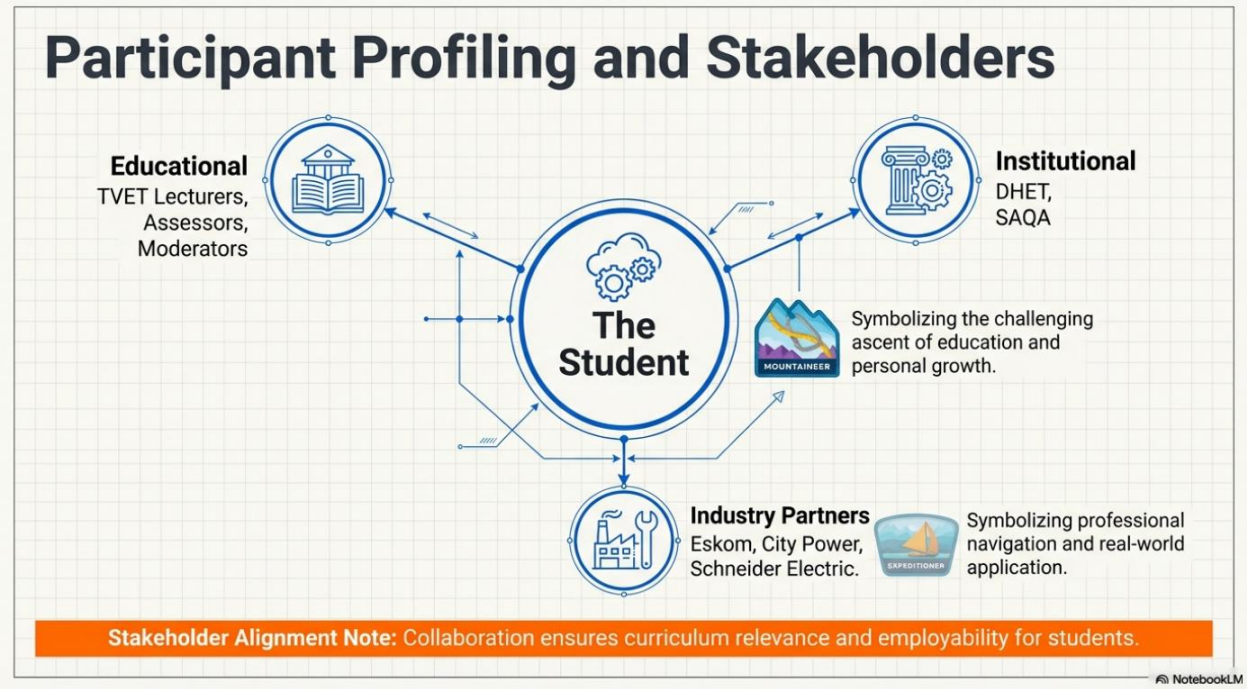

The Rural Energy Crisis Meets the Skills Gap
Double Jeopardy: Rural students face poor infrastructure and a curriculum disconnected from local energy realities.
The Need: Training must adapt to Renewable Optimization, Microgrids, and Solar.
Industry Disconnect: NATED curricula often fail to account for rural electrification maintenance.
NotebookLM

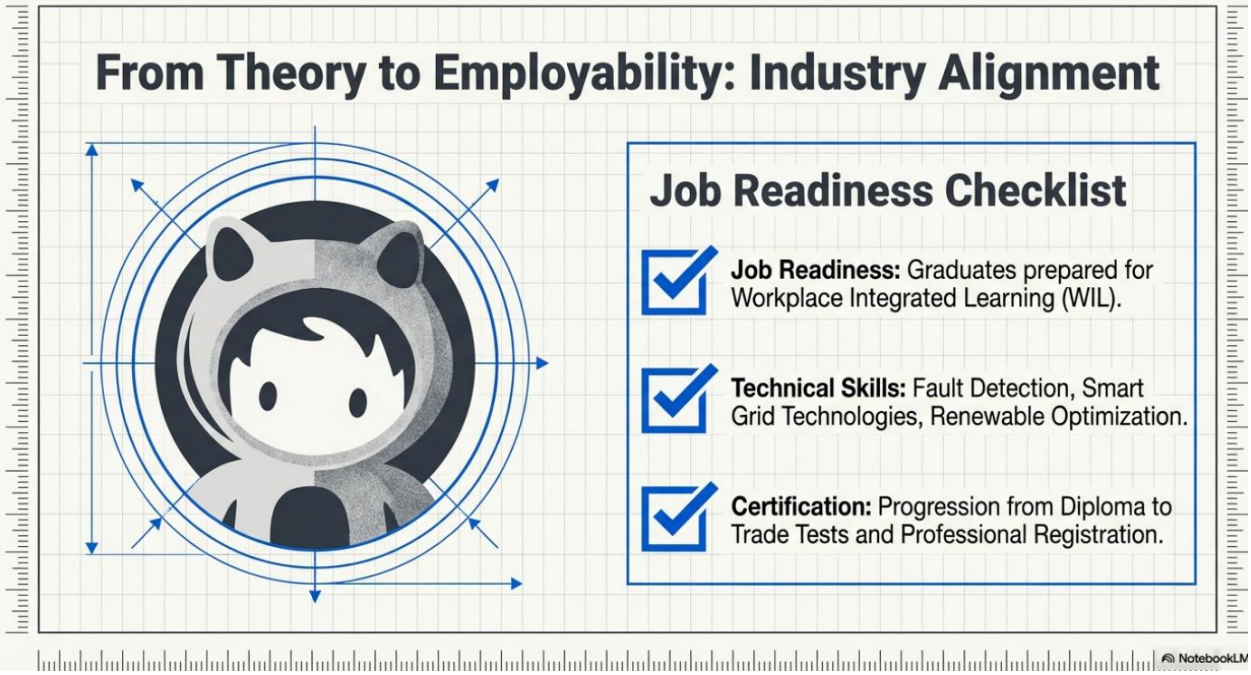

The Proposal: A Unified Vocational Framework
Synchronizing academic learning with vocational reality.
NATED
(Theory)
Integration Framework
NCV
(Practice)
Curriculum Structure:
Simultaneous modules for coursework and skills.
Blended Approach:
Online learning + Classroom + Workplace Integrated Learning (WIL).
Objective:
Moving from Textbook Only to Competency-Based Execution.
NotebookLM


Theoretical Basis: Experiential Learning Theory (ELT)
Concrete Experience
(On-the-job training)
Reflective Observation
(Self-assessments)
Abstract Conceptualization
(Connecting theory to practice)
Active Experimentation
(Design projects)
Validating the shift from passive listening to "Learning by Doing" in engineering trades.
NotebookLM

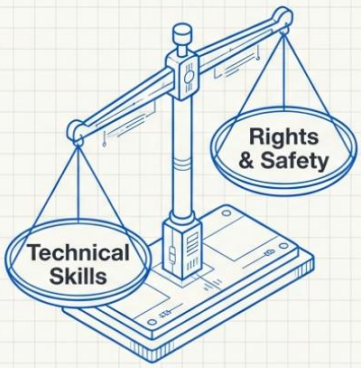

Digital Transformation via Learning Management Systems
Centralizing data and automating learning for operational excellence.
CENTRAL DATA REPOSITORY & LMS
CENTRAL DATA REPOSITORY & LMS
1. Real-Time Tracking
Automating learner performance to eliminate backlogs.
2. Data Integrity
Verifiable Statement of Results and Certificates.
3. Accessibility
Web-based platforms for distance learning in rural areas.
Governance Note:
Compliance: Adherence to POPIA (Protection of Personal Information Act) for student and employee data security.
NotebookLM


Research Design and Methodology
Month
Month
1
3
4
6
7
9
Time
Month
Diagnosis
Investigating systemic irregularities and policy gaps via qualitative interviews.
Design
Developing the Engineering Model for NATED/NCV integration.
Validation
Convenience sampling of TVET lecturers, engineering experts, and industry participants.
Data Sources: DHET policies, SAQA frameworks, employment records.
NotebookLM


Participant Profiling and Stakeholders
Educational
TVET Lecturers, Assessors, Moderators
Institutional
DHET, SAQA
The Student
MOUNTAINEER
Symbolizing the challenging ascent of education and personal growth.
Industry Partners
Eskom, City Power, Schneider Electric.
EXPEDITIONER
Symbolizing professional navigation and real-world application.
Stakeholder Alignment Note: Collaboration ensures curriculum relevance and employability for students.
NotebookLM


From Theory to Employability: Industry Alignment
Job Readiness Checklist
Job Readiness: Graduates prepared for Workplace Integrated Learning (WIL).
Technical Skills: Fault Detection, Smart Grid Technologies, Renewable Optimization.
Certification: Progression from Diploma to Trade Tests and Professional Registration.
NotebookLM

Governance, Labor Rights, and Social Justice



Governance Priorities
Technical Slate DIN Pro

- **Fair Labor Practices:** Addressing remuneration, appointments, and labor relations.
- **Protection:** Ensuring a safe learning environment (Safety Protocols against Harassment).
- **Compliance:** Strict adherence to Labor Relations Act and Workshop Safety Standards.

NotebookLM

Education as a Tool for Social Justice

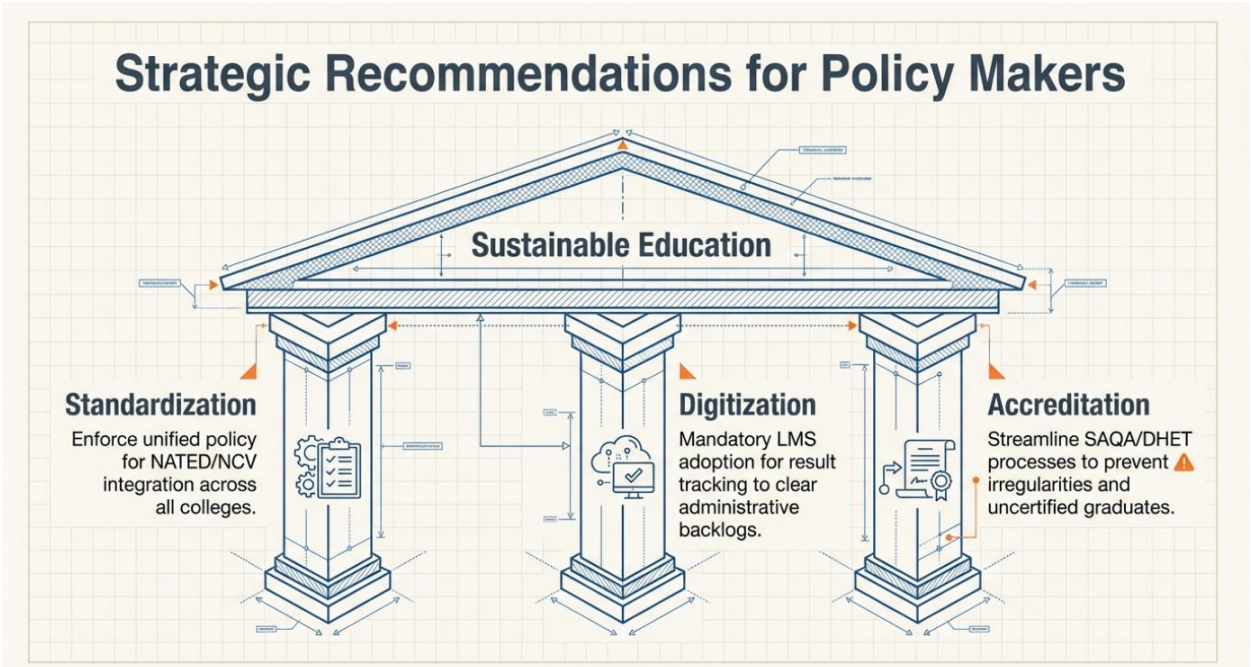
Activism Row: Technical education must not only produce skilled workers but also but also informed citizens who understand the social impact of technology, for

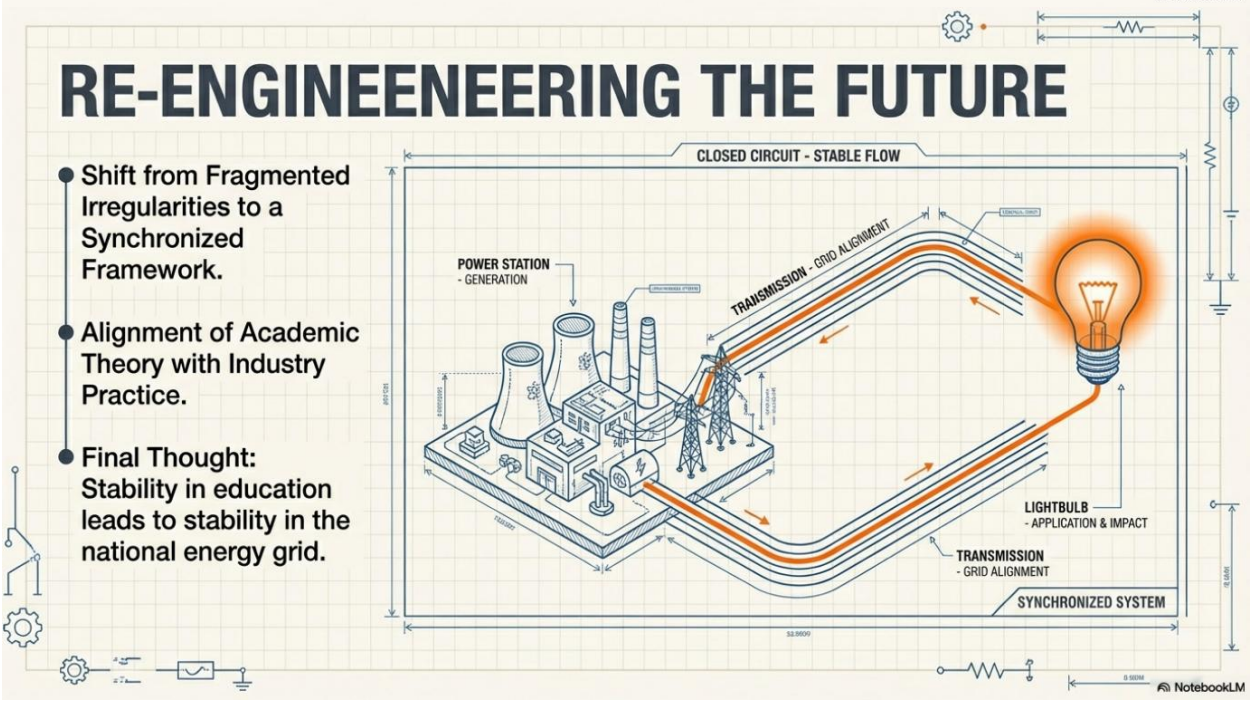
Democratization:
Breaking monopolies to allow fair access for rural learners.

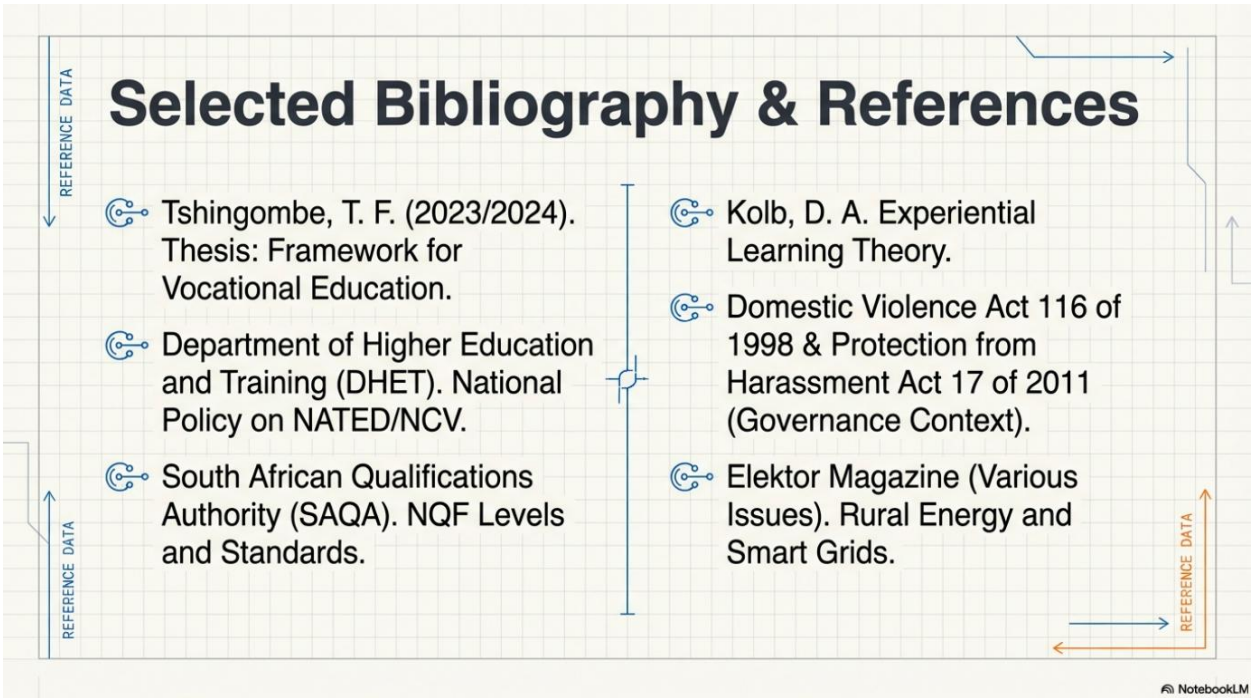
Human Rights:
Access to quality technical education is a constitutional right.

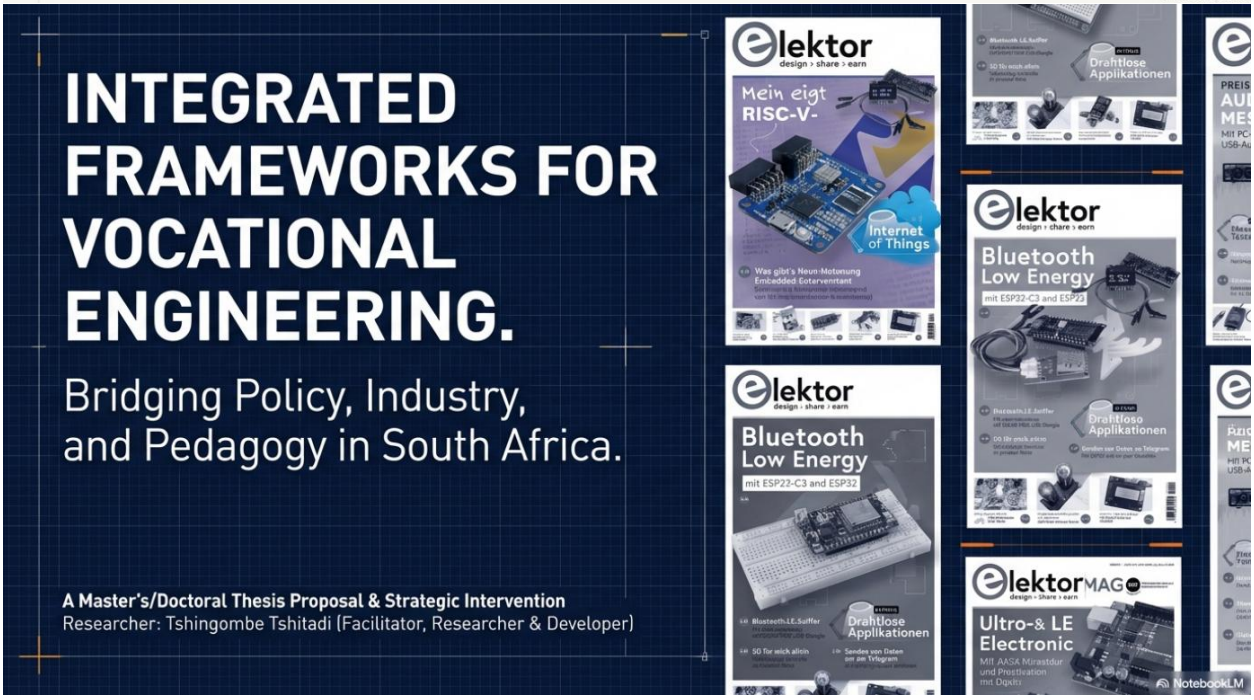
Economic Empowerment:
Technical skills as the primary driver for poverty alleviation.

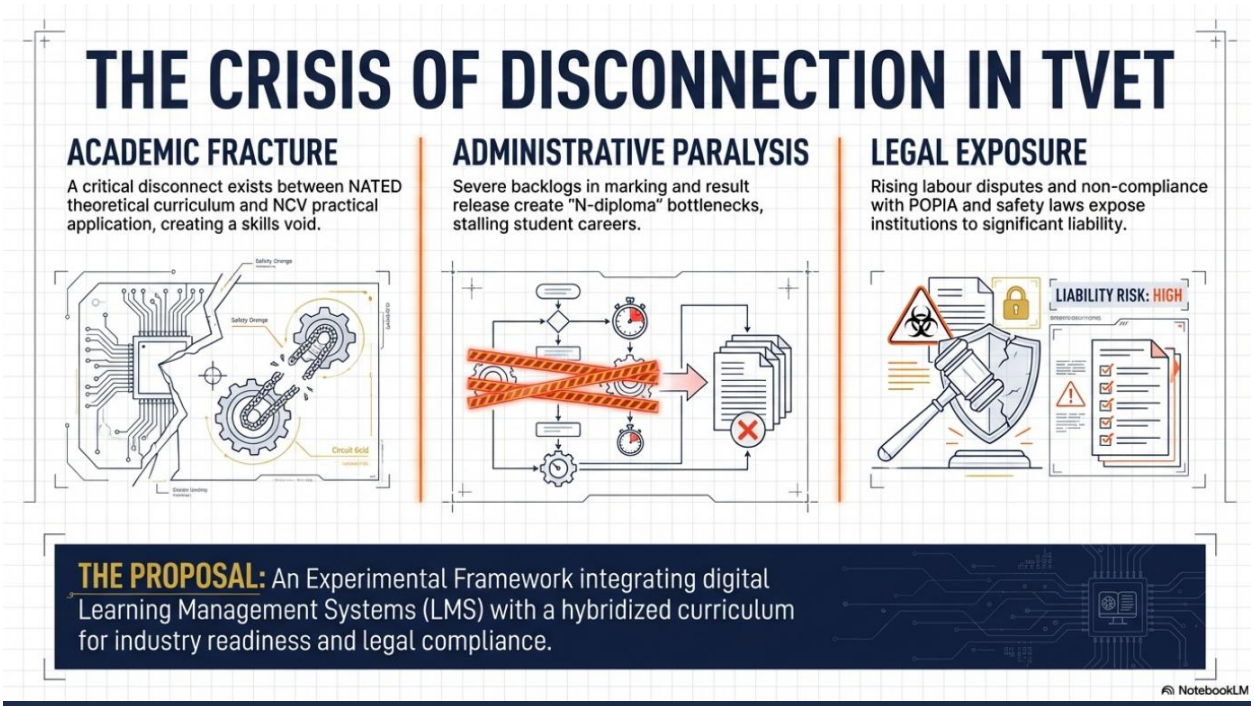
NotebookLM

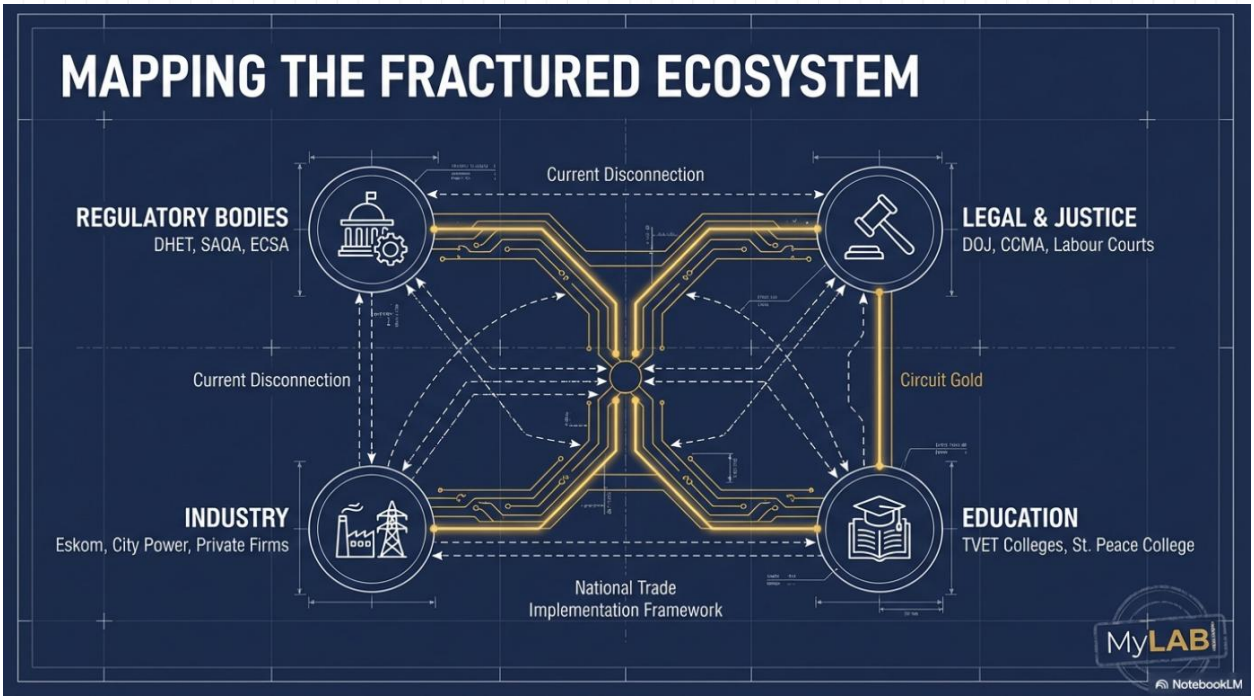

Strategic Recommendations for Policy Makers
Sustainable Education
Standardization
Enforce unified policy for NATED/NCV integration across all colleges.
Digitization
Mandatory LMS adoption for result tracking to clear administrative backlogs.
Accreditation
Streamline SAQA/DHET processes to prevent irregularities and uncertified graduates.
NotebookLM

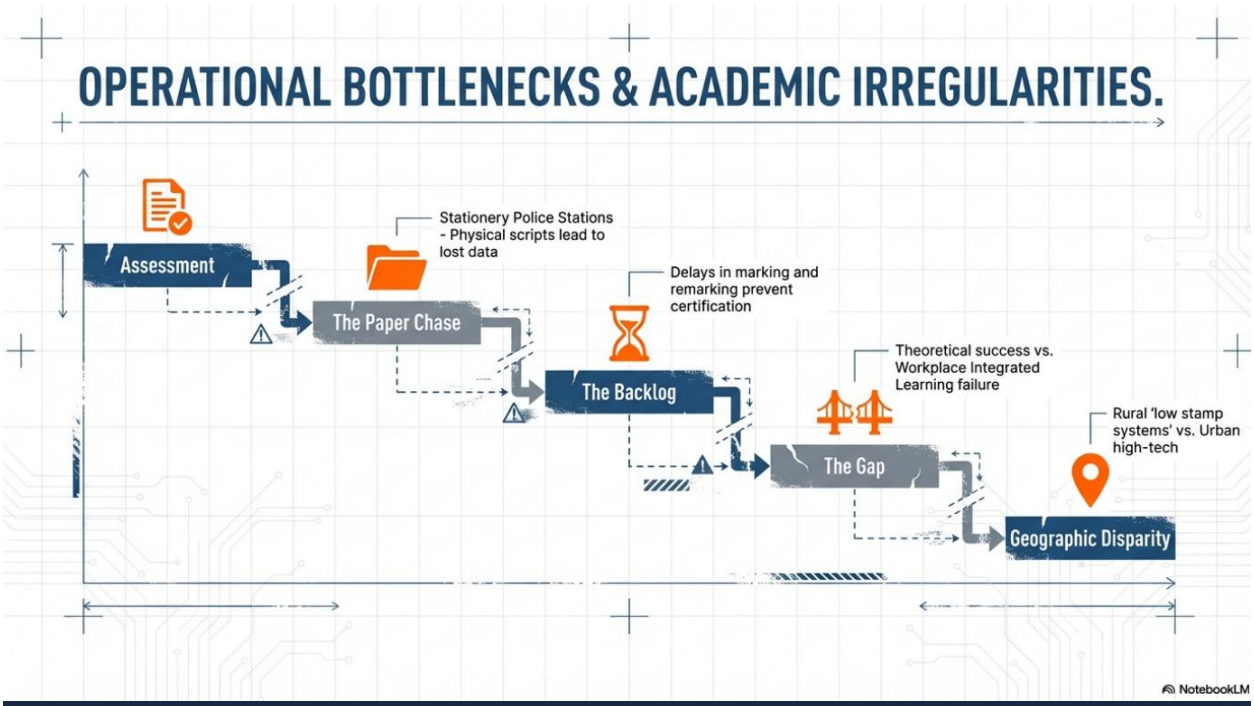

RE-ENGINEENEERING THE FUTURE
Shift from Fragmented Irregularities to a Synchronized Framework.
Alignment of Academic Theory with Industry Practice.
Final Thought: Stability in education leads to stability in the national energy grid.
CLOSED CIRCUIT - STABLE FLOW
POWER STATION - GENERATION
TRANSMISSION - GRID ALIGNMENT
LIGHTBULB - APPLICATION & IMPACT
TRANSMISSION - GRID ALIGNMENT
SYNCHRONIZED SYSTEM
NotebookLM

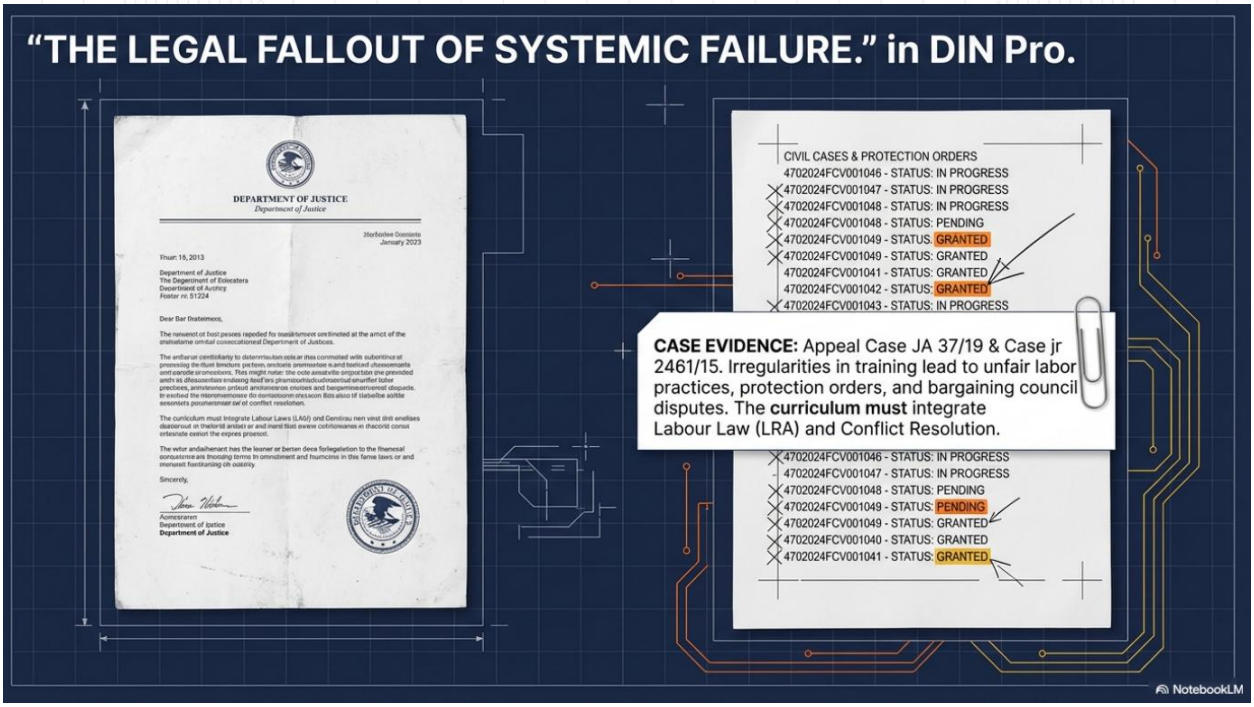

Selected Bibliography & References
REFERENCE DATA
Tshingombe, T. F. (2023/2024). Thesis: Framework for Vocational Education.
Department of Higher Education and Training (DHET). National Policy on NATED/NCV.
South African Qualifications Authority (SAQA). NQF Levels and Standards.
Kolb, D. A. Experiential Learning Theory.
Domestic Violence Act 116 of 1998 & Protection from Harassment Act 17 of 2011 (Governance Context).
Elektor Magazine (Various Issues). Rural Energy and Smart Grids.
REFERENCE DATA
REFERENCE DATA
NotebookLM

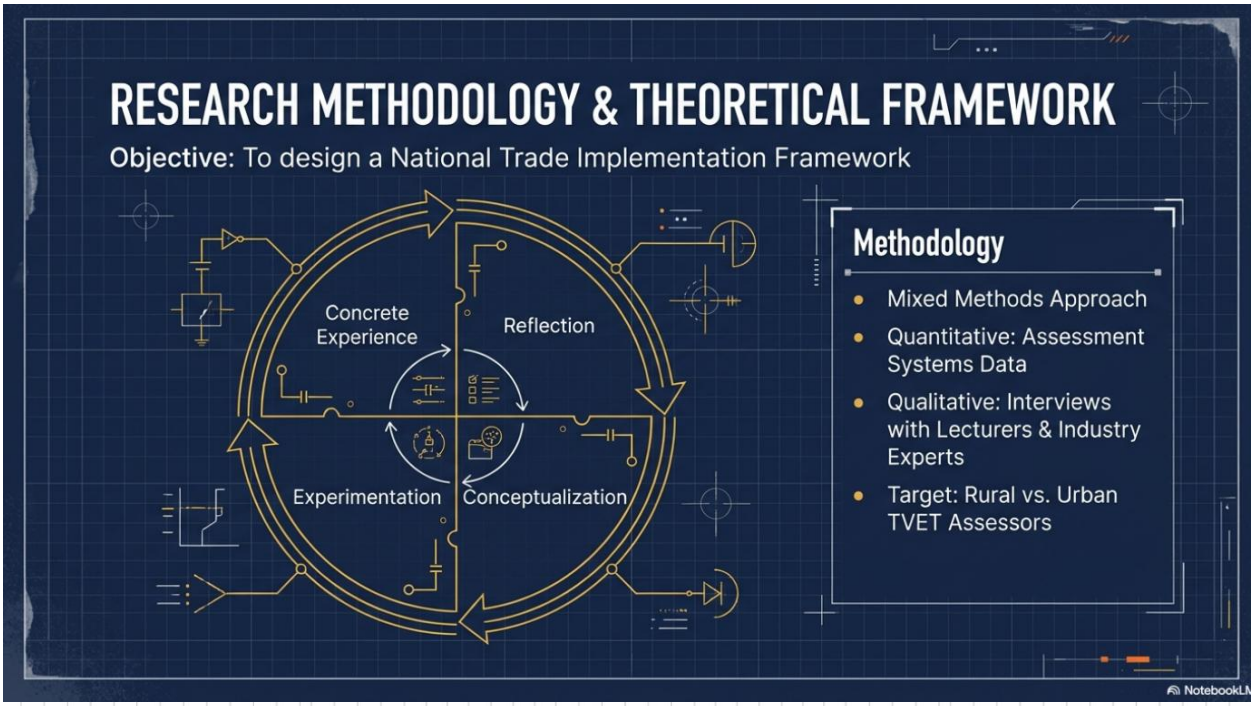

INTEGRATED FRAMEWORKS FOR VOCATIONAL ENGINEERING.
Bridging Policy, Industry, and Pedagogy in South Africa.
A Master's/Doctoral Thesis Proposal & Strategic Intervention
Researcher: Tshingombe Tshitadi (Facilitator, Researcher & Developer)
elektor
Mein eigt RISC-V-
Internet of Things
Drahtlose Applikationen
Bluetooth Low Energy
mit ESP22-C3 and ESP32
elektorMAG
Ultro-& LE Electronic
NotebookLM

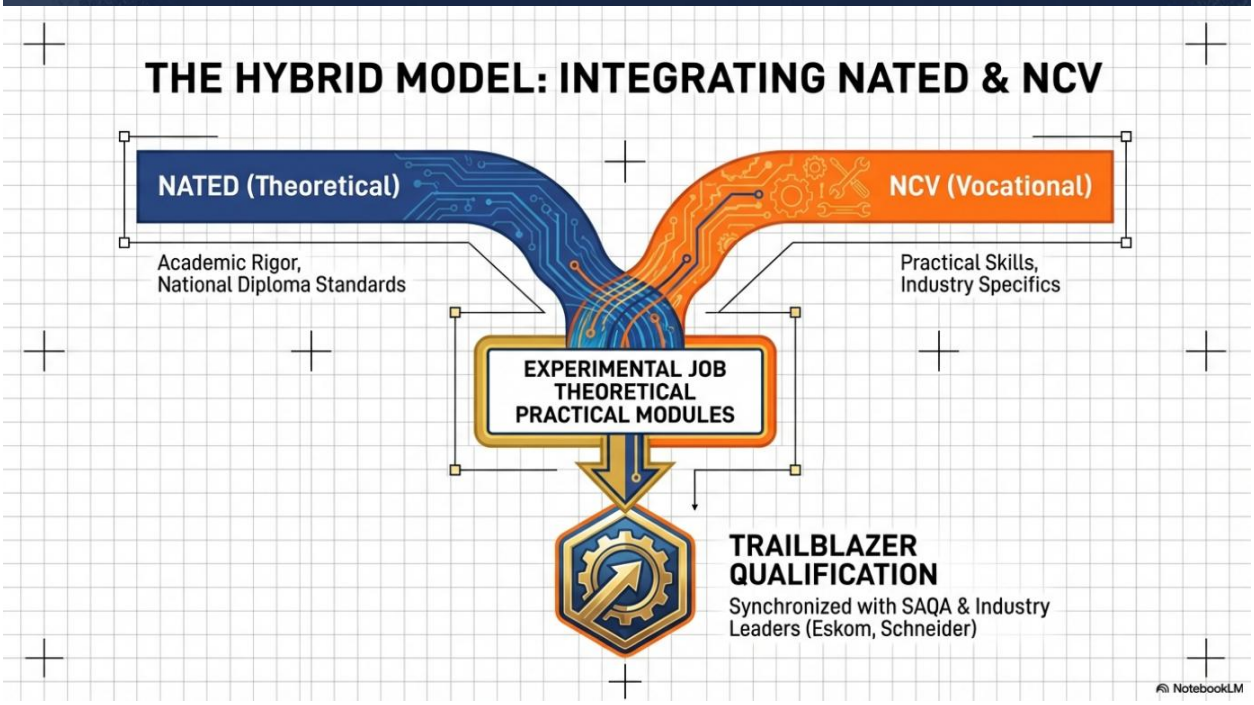

THE CRISIS OF DISCONNECTION IN TVET
ACADEMIC FRACTURE
A critical disconnect exists between NATED theoretical curriculum and NCV practical application, creating a skills void.
ADMINISTRATIVE PARALYSIS
Severe backlogs in marking and result release create "N-diploma" bottlenecks, stalling student careers.
LEGAL EXPOSURE
Rising labour disputes and non-compliance with POPIA and safety laws expose institutions to significant liability.
LIABILITY RISK: HIGH
THE PROPOSAL: An Experimental Framework integrating digital Learning Management Systems (LMS) with a hybridized curriculum for industry readiness and legal compliance.
NotebookLM

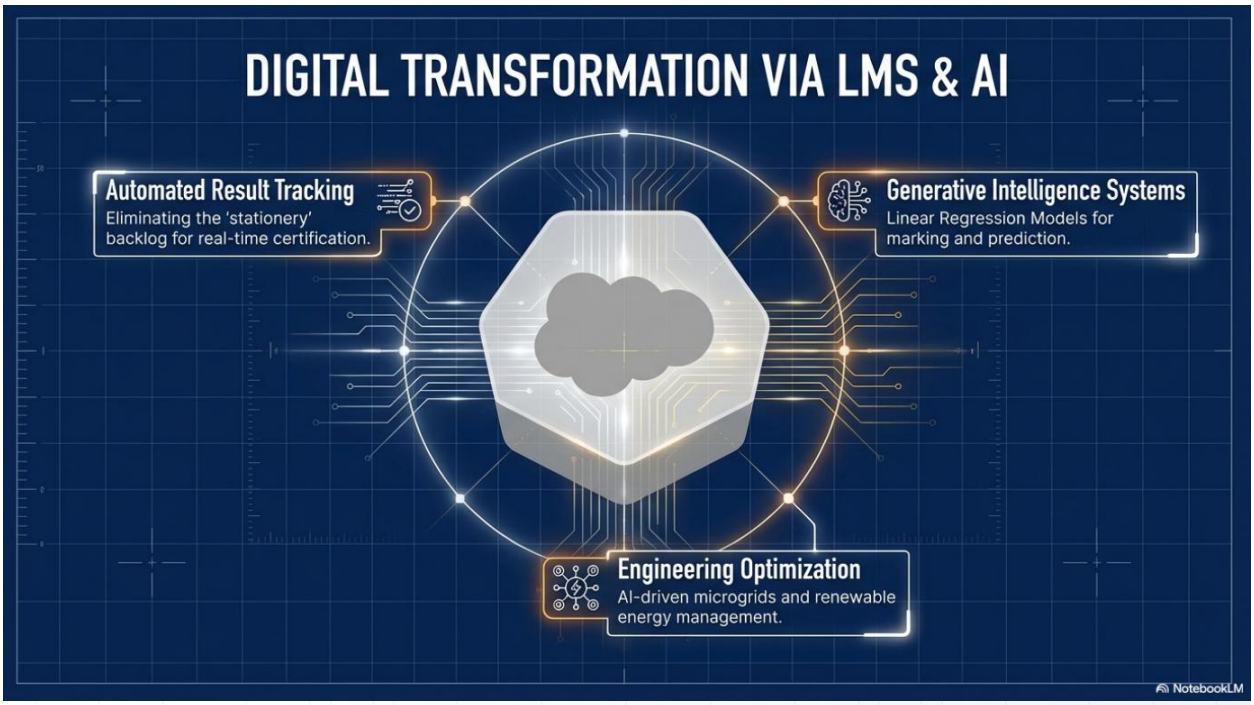

MAPPING THE FRACTURED ECOSYSTEM
Current Disconnection
REGULATORY BODIES
DHET, SAQA, ECSA
LEGAL & JUSTICE
DOJ, CCMA, Labour Courts
Current Disconnection
Circuit Gold
INDUSTRY
Eskom, City Power, Private Firms
EDUCATION
TVET Colleges, St. Peace College
National Trade Implementation Framework
MyLAB
NotebookLM

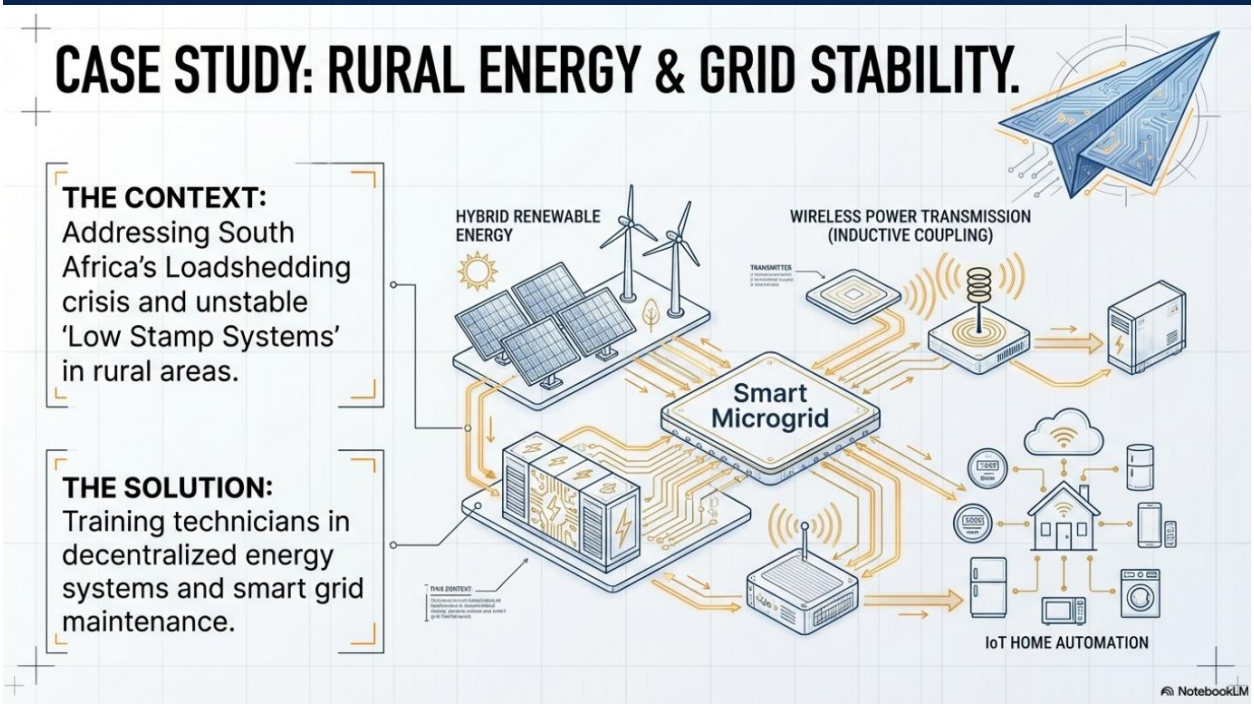

OPERATIONAL BOTTLENECKS & ACADEMIC IRREGULARITIES.
Assessment
Stationery Police Stations - Physical scripts lead to lost data
The Paper Chase
Delays in marking and remarking prevent certification
The Backlog
Theoretical success vs. Workplace Integrated Learning failure
The Gap
Rural 'low stamp systems' vs. Urban high-tech
Geographic Disparity
NotebookLM

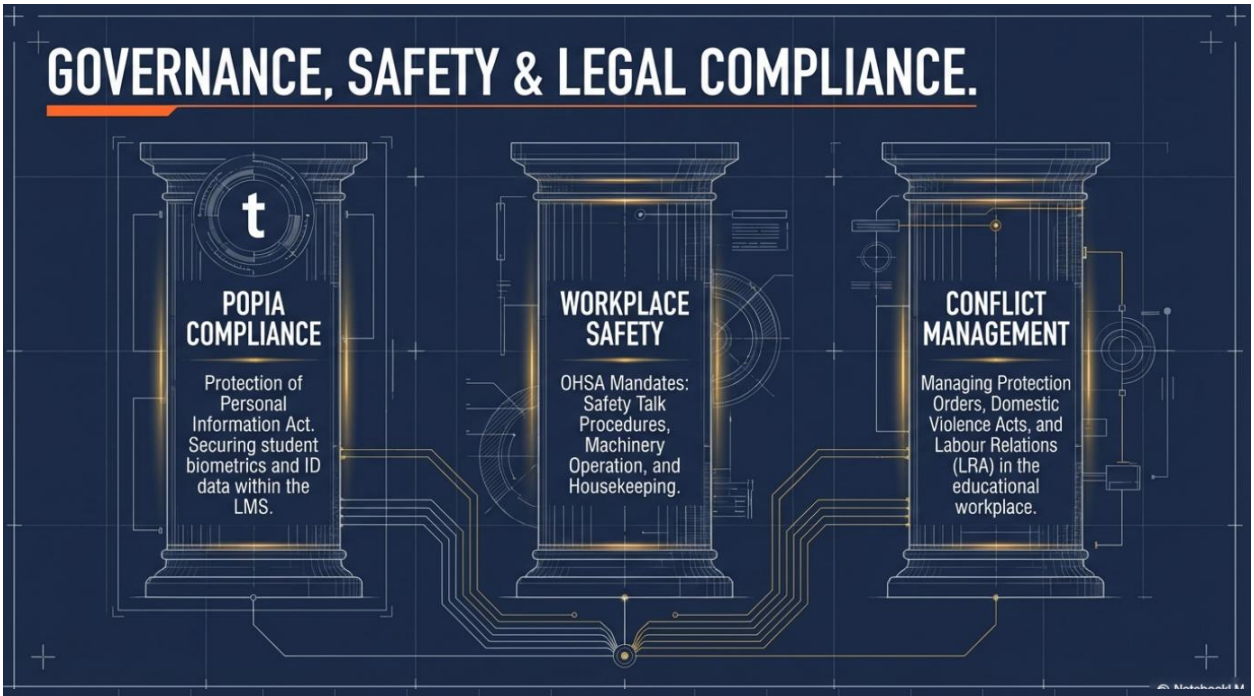

"THE LEGAL FALLOUT OF SYSTEMIC FAILURE." in DIN Pro.
DEPARTMENT OF JUSTICE
Department of Justice
CIVIL CASES & PROTECTION ORDERS
4702024FCV001046 - STATUS: IN PROGRESS
4702024FCV001047 - STATUS: IN PROGRESS
4702024FCV001048 - STATUS: IN PROGRESS
4702024FCV001048 - STATUS: PENDING
4702024FCV001049 - STATUS: GRANTED
4702024FCV001049 - STATUS: GRANTED
4702024FCV001041 - STATUS: GRANTED
4702024FCV001042 - STATUS: GRANTED
4702024FCV001043 - STATUS: IN PROGRESS
CASE EVIDENCE: Appeal Case JA 37/19 & Case jr 2461/15. Irregularities in training lead to unfair labor practices, protection orders, and bargaining council disputes. The curriculum must integrate Labour Law (LRA) and Conflict Resolution.
4702024FCV001046 - STATUS: IN PROGRESS
4702024FCV001047 - STATUS: IN PROGRESS
4702024FCV001048 - STATUS: PENDING
4702024FCV001049 - STATUS: PENDING
4702024FCV001049 - STATUS: GRANTED
4702024FCV001040 - STATUS: GRANTED
4702024FCV001041 - STATUS: GRANTED
NotebookLM


RESEARCH METHODOLOGY & THEORETICAL FRAMEWORK
Objective: To design a National Trade Implementation Framework
Concrete Experience
Reflection
Experimentation
Conceptualization
Methodology
Mixed Methods Approach
Quantitative: Assessment Systems Data
Qualitative: Interviews with Lecturers & Industry Experts
Target: Rural vs. Urban TVET Assessors
NotebookLM

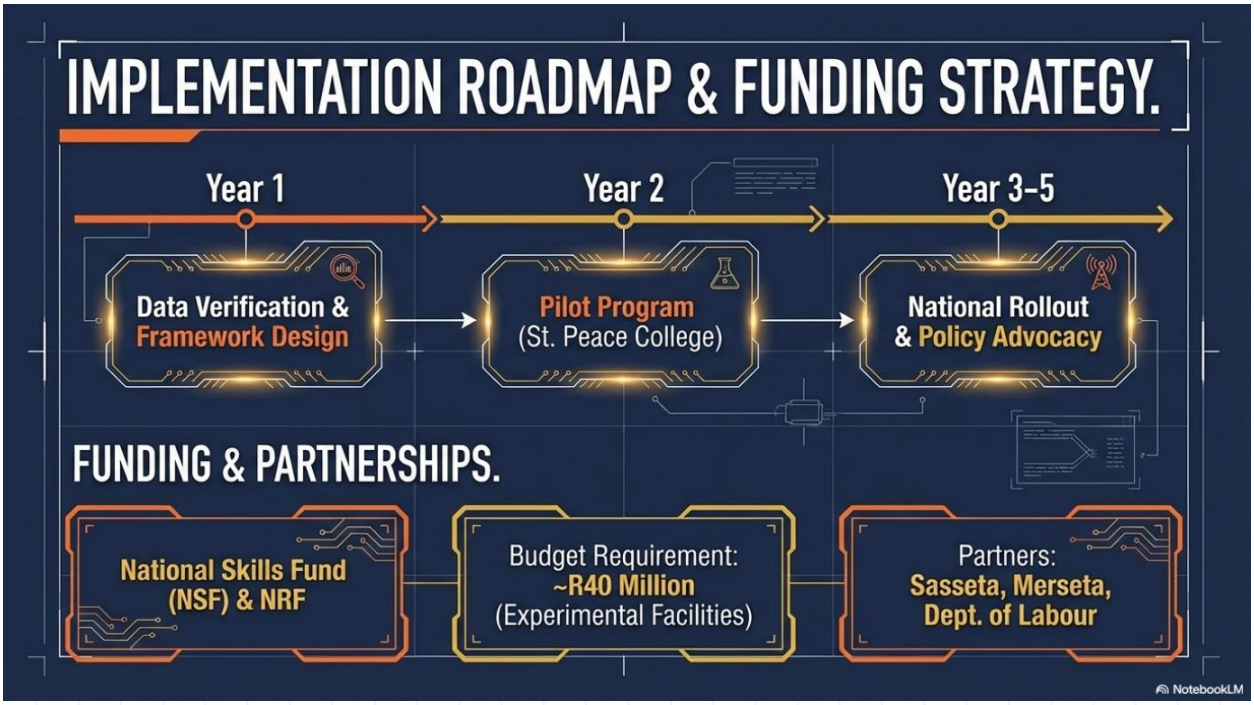

THE HYBRID MODEL: INTEGRATING NATED & NCV
NATED (Theoretical)
NCV (Vocational)
Academic Rigor, National Diploma Standards
Practical Skills, Industry Specifics
EXPERIMENTAL JOB
THEORETICAL
PRACTICAL MODULES
TRAILBLAZER QUALIFICATION
Synchronized with SAQA & Industry Leaders (Eskom, Schneider)
NotebookLM

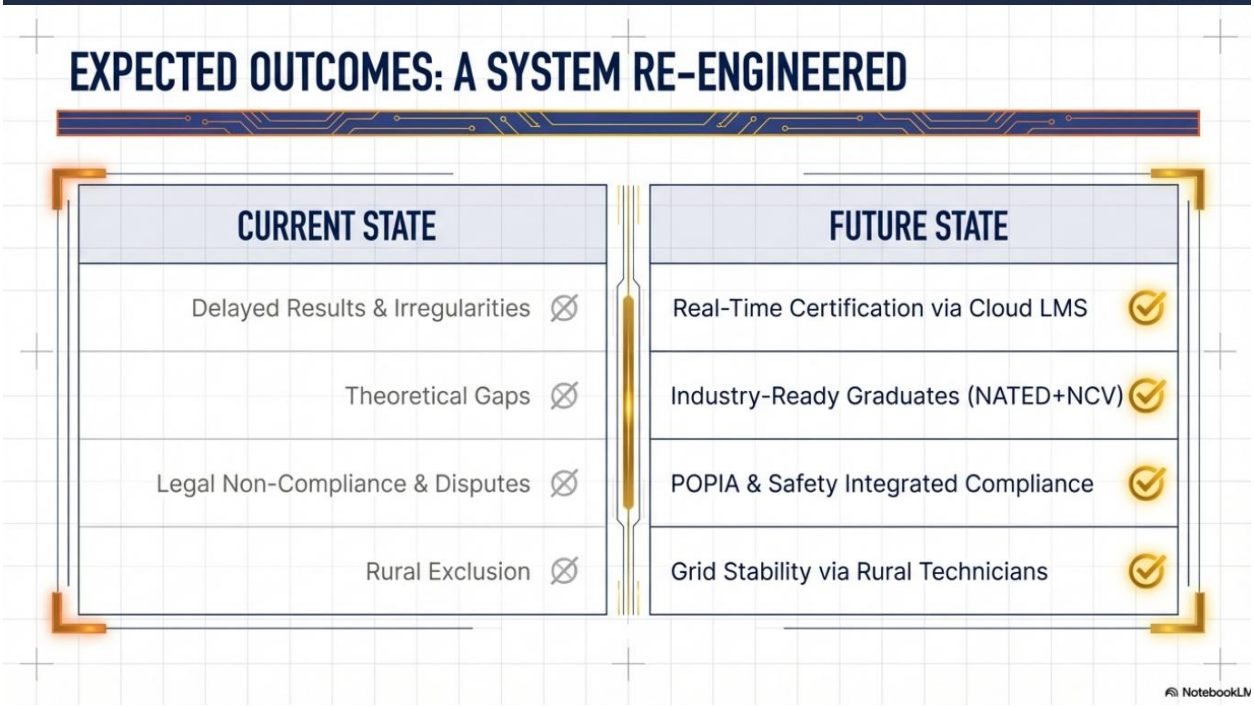

DIGITAL TRANSFORMATION VIA LMS & AI
Automated Result Tracking
Eliminating the 'stationery' backlog for real-time certification.
Generative Intelligence Systems
Linear Regression Models for marking and prediction.
Engineering Optimization
AI-driven microgrids and renewable energy management.
NotebookLM


CASE STUDY: RURAL ENERGY & GRID STABILITY.
THE CONTEXT:
Addressing South Africa's Loadshedding crisis and unstable 'Low Stamp Systems' in rural areas.
THE SOLUTION:
Training technicians in decentralized energy systems and smart grid maintenance.
HYBRID RENEWABLE ENERGY
WIRELESS POWER TRANSMISSION (INDUCTIVE COUPLING)
Smart Microgrid
IoT HOME AUTOMATION
NotebookLM

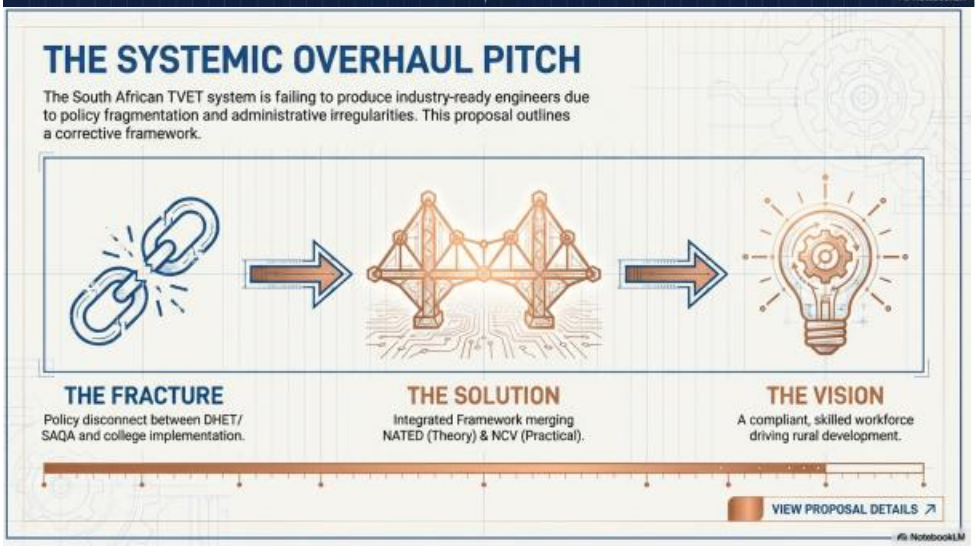

GOVERNANCE, SAFETY & LEGAL COMPLIANCE.
POPIA COMPLIANCE
Protection of Personal Information Act. Securing student biometrics and ID data within the LMS.
WORKPLACE SAFETY
OHSA Mandates: Safety Talk Procedures, Machinery Operation, and Housekeeping.
CONFLICT MANAGEMENT
Managing Protection Orders, Domestic Violence Acts, and Labour Relations (LRA) in the educational workplace.

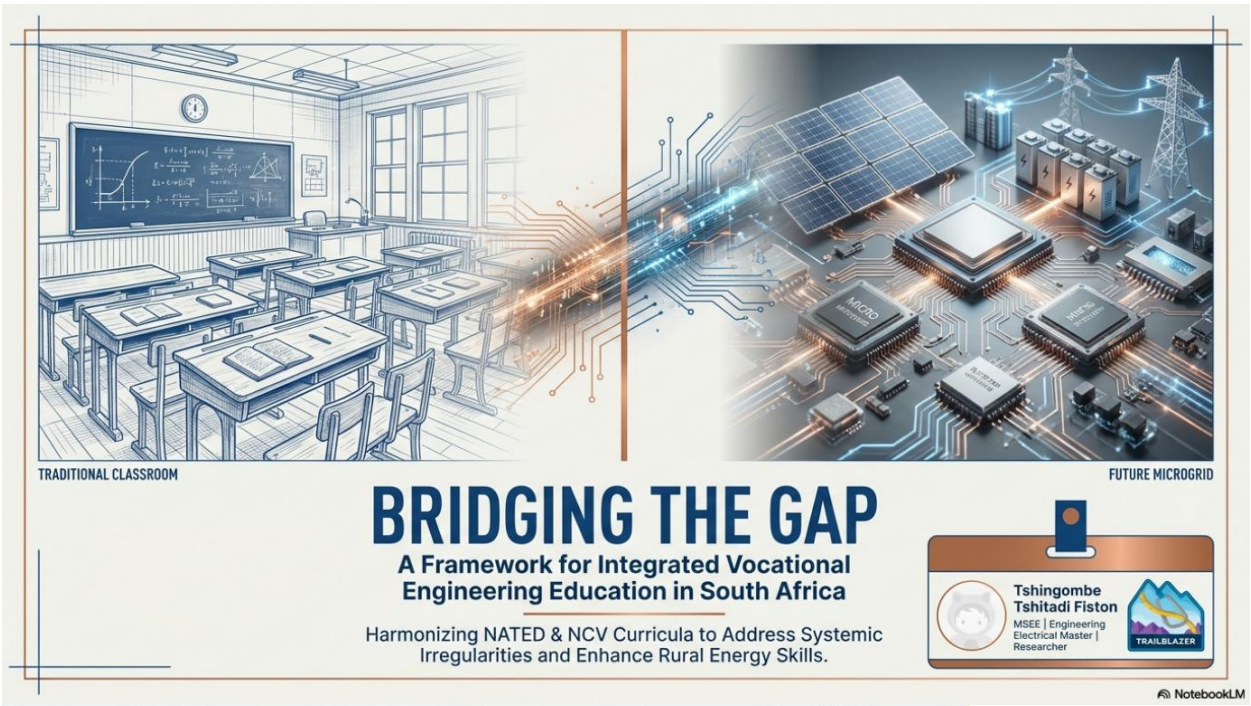
EMPOWERING THE 'TRAILBLAZER' LECTURER.
MOUNTAINEER
EXPEDITIONER
THE INTERVENTION: Continuous Professional Development (CPD).
1. Upskilling in Automation & Pedagogy.
2. Induction and Mentoring Programs.
3. Psychological Safety against Bureaucracy and Setbacks.
NotebookLM

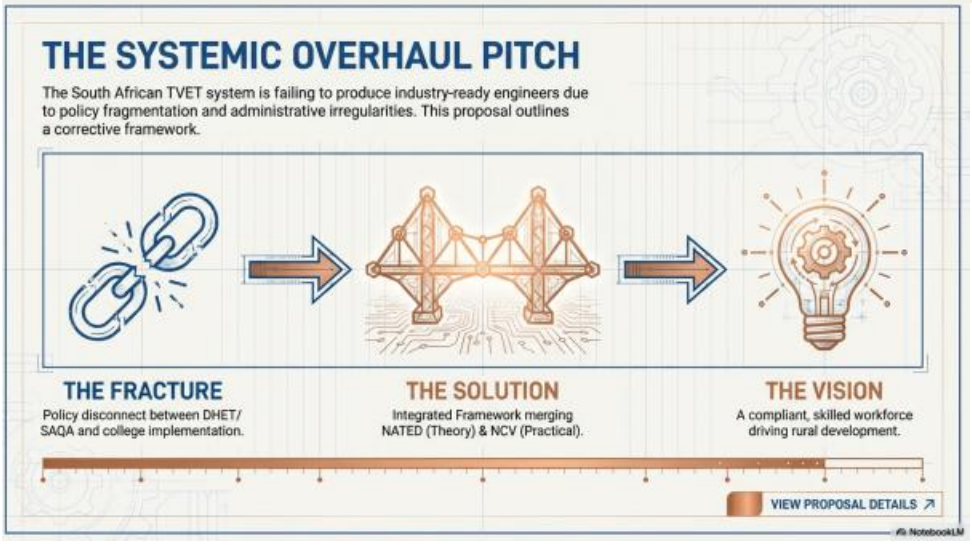

IMPLEMENTATION ROADMAP & FUNDING STRATEGY.
Year 1
Year 2
Year 3-5
Data Verification & Framework Design
Pilot Program (St. Peace College)
National Rollout & Policy Advocacy
FUNDING & PARTNERSHIPS.
National Skills Fund (NSF) & NRF
Budget Requirement: ~R40 Million (Experimental Facilities)
Partners: Sasseta, Merseta, Dept. of Labour
NotebookLM


EXPECTED OUTCOMES: A SYSTEM RE-ENGINEERED
CURRENT STATE
Delayed Results & Irregularities
Theoretical Gaps
Legal Non-Compliance & Disputes
Rural Exclusion
FUTURE STATE
Real-Time Certification via Cloud LMS
Industry-Ready Graduates (NATED+NCV)
POPIA & Safety Integrated Compliance
Grid Stability via Rural Technicians
NotebookLM

RE-ENGINEERING THE SOCIAL CONTRACT.
TSHINGOMBE TSHITADI
Facilitator | Researcher | Trailblazer
"Fixing the pipeline from education to employment to ensure a stable, powered, and legally sound South Africa."
SUPPORT THE NATIONAL TRADE IMPLEMENTATION FRAMEWORK.


THE SYSTEMIC OVERHAUL PITCH
The South African TVET system is failing to produce industry-ready engineers due to policy fragmentation and administrative irregularities. This proposal outlines a corrective framework.
THE FRACTURE
Policy disconnect between DHET/ SAQA and college implementation.
THE SOLUTION
Integrated Framework merging NATED (Theory) & NCV (Practical).
THE VISION
A compliant, skilled workforce driving rural development.
VIEW PROPOSAL DETAILS


TRADITIONAL CLASSROOM
FUTURE MICROGRID
BRIDGING THE GAP
A Framework for Integrated Vocational Engineering Education in South Africa
Harmonizing NATED & NCV Curricula to Address Systemic Irregularities and Enhance Rural Energy Skills.
Tshingombe Tshitadi Fiston
MSEE | Engineering Electrical Master | Researcher
TRAILBLAZER
NotebookLM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VIEW PROPOSAL DETAILS
NotebookLM

DEFINING THE CRISIS: SYSTEMIC IRREGULARITIES

- **Administrative Backlogs:** Delays in marking and lost portfolios prevent certification.
- **The Rural Divide:** Critical lack of facilitators and equipment in rural TVET colleges compared to urban centers.
- **Policy Mismatch:** Conflict between DHET, SAQA, and local colleges leads to invalid results and "Druip" (failure) due to error.

THE HUMAN ELEMENT: GOVERNANCE & LABOR JUSTICE

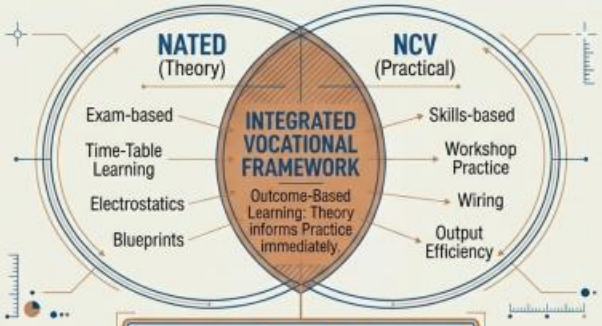
THE LECTURER'S PLIGHT

- Labor Disputes (CCMA/Labour Court Case JA 37/19)
- Unpaid wages and bargaining levy disputes
- Need for protection against workplace violence (Domestic Violence Act 116 of 1998)

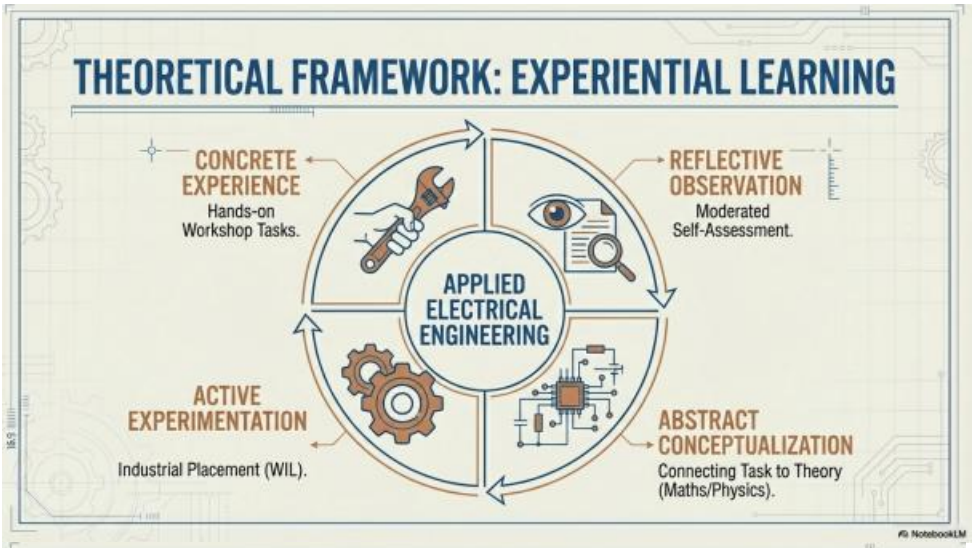
THE ADMINISTRATIVE BURDEN

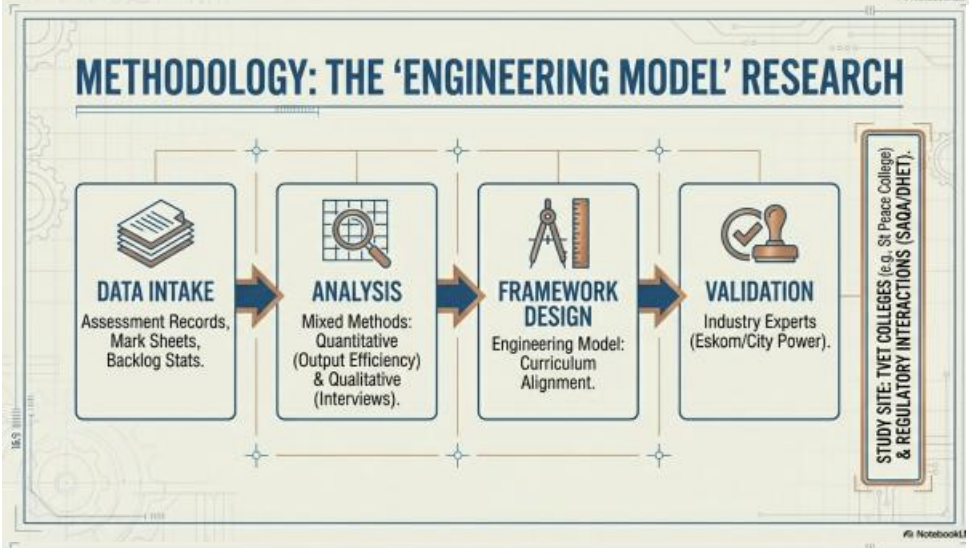
The reality of 'Referral' systems and legal compliance.

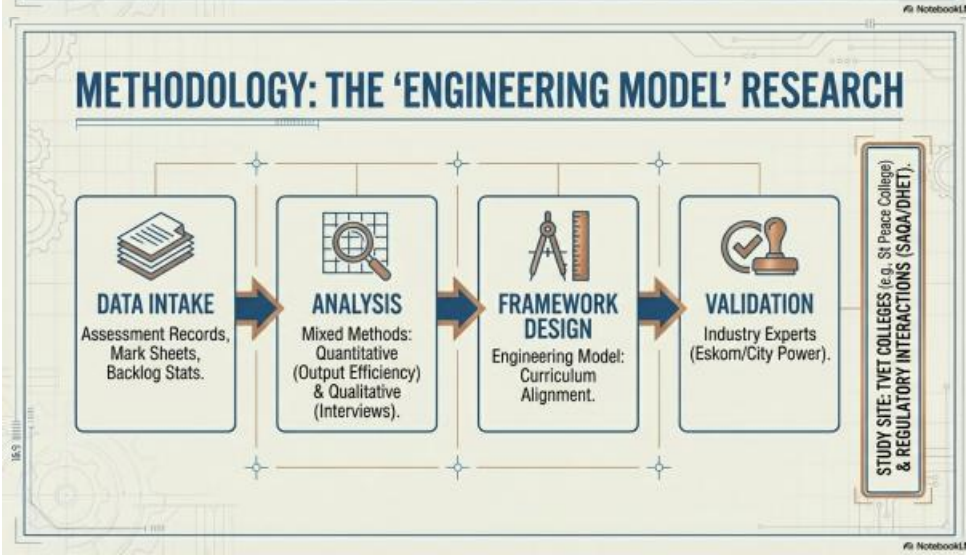
CORE PROPOSAL: INTEGRATING NATED & NCV



Moving from 'Time Table' attendance to 'Competence' demonstration.


THEORETICAL FRAMEWORK: EXPERIENTIAL LEARNING
CONCRETE EXPERIENCE
Hands-on Workshop Tasks.
REFLECTIVE OBSERVATION
Moderated Self-Assessment.
APPLIED ELECTRICAL ENGINEERING
ACTIVE EXPERIMENTATION
Industrial Placement (WIL).
ABSTRACT CONCEPTUALIZATION
Connecting Task to Theory (Maths/Physics).


METHODOLOGY: THE 'ENGINEERING MODEL' RESEARCH
DATA INTAKE
Assessment Records, Mark Sheets, Backlog Stats.
ANALYSIS
Mixed Methods: Quantitative (Output Efficiency) & Qualitative (Interviews).
FRAMEWORK DESIGN
Engineering Model: Curriculum Alignment.
VALIDATION
Industry Experts (Eskom/City Power).
STUDY SITE: TVET COLLEGES (e.g., St Peace College) & REGULATORY INTERACTIONS (SAQA/DHET).


METHODOLOGY: THE 'ENGINEERING MODEL' RESEARCH
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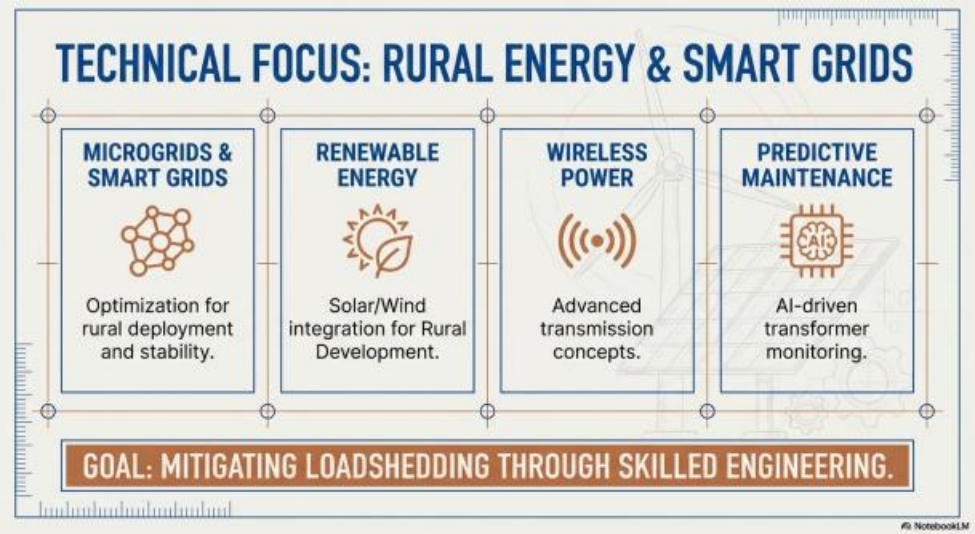
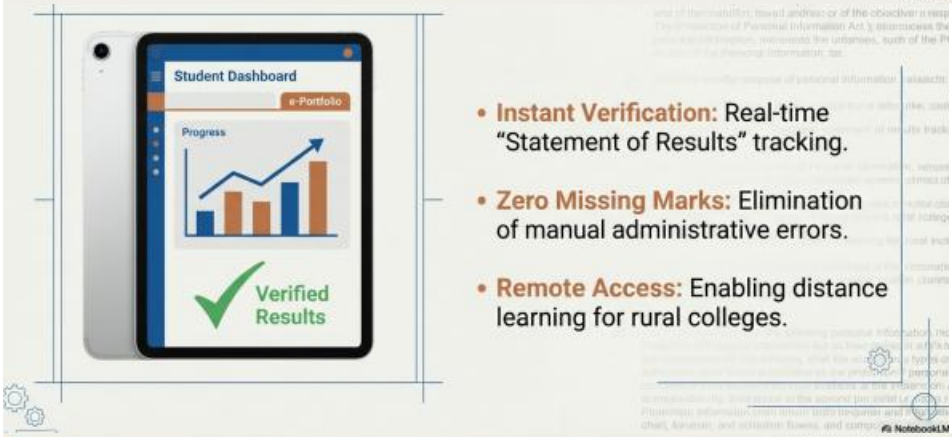
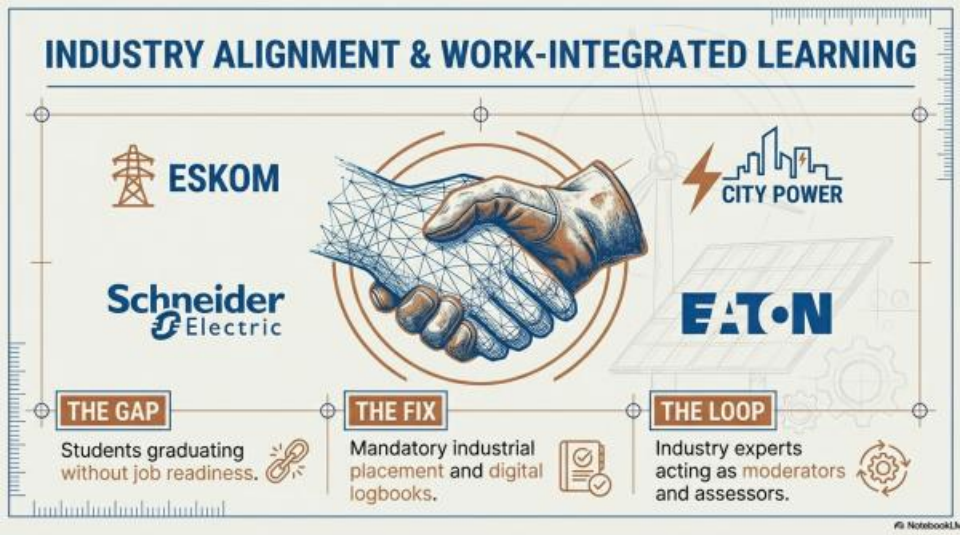
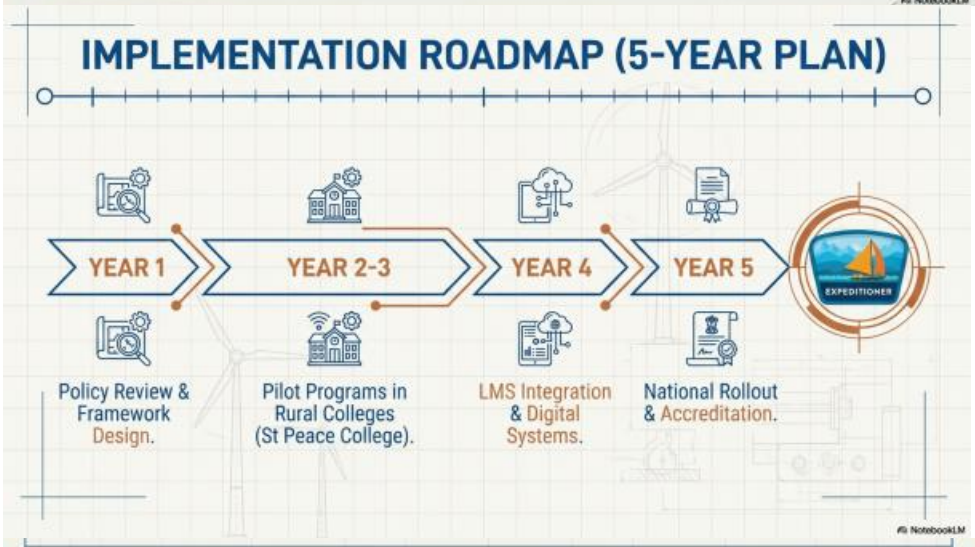
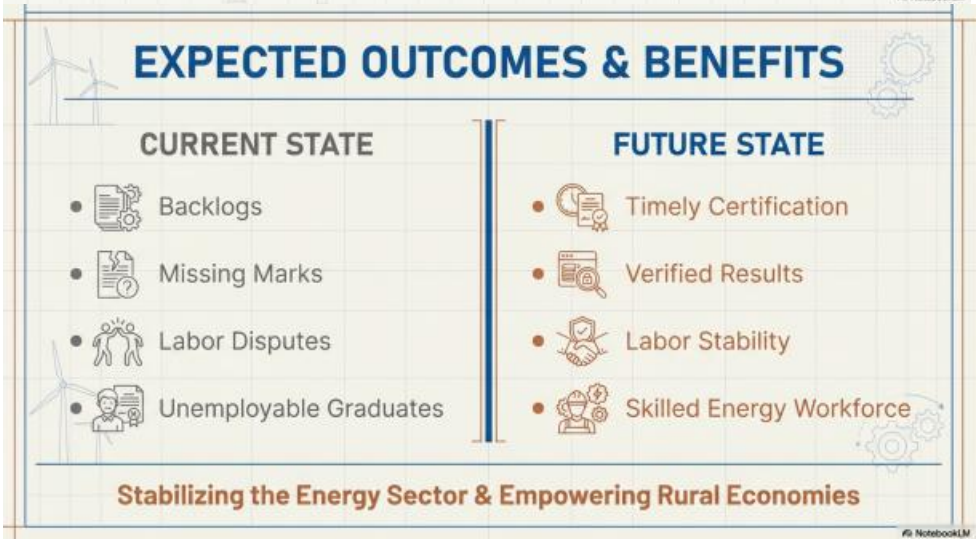

TECHNICAL FOCUS: RURAL ENERGY & SMART GRIDS
MICROGRIDS & SMART GRIDS
Optimization for rural deployment and stability.
RENEWABLE ENERGY
Solar/Wind integration for Rural Development.
WIRELESS POWER
Advanced transmission concepts.
PREDICTIVE MAINTENANCE
AI-driven transformer monitoring.
GOAL: MITIGATING LOADSHEDDING THROUGH SKILLED ENGINEERING.

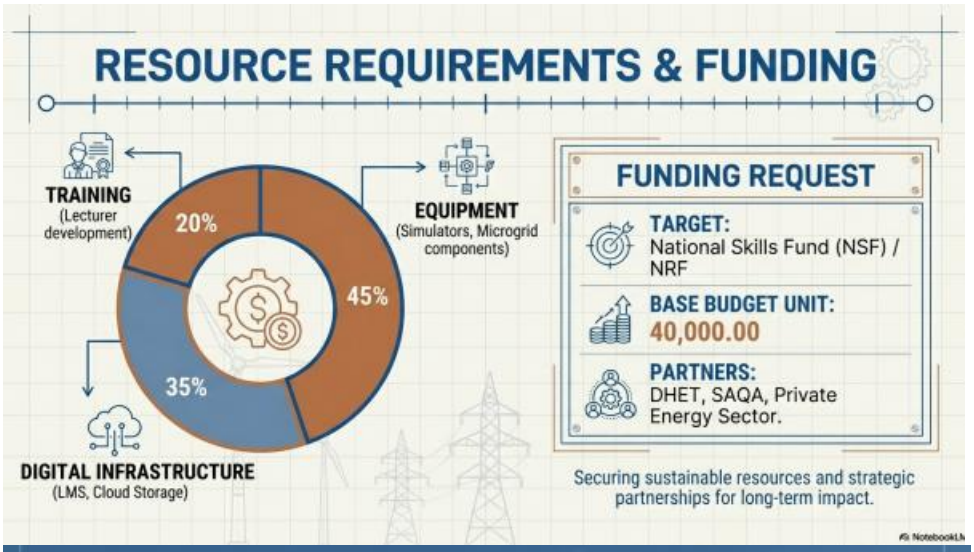

Student Dashboard
e-Portfolio
Progress
Verified Results
• Instant Verification: Real-time "Statement of Results" tracking.
• Zero Missing Marks: Elimination of manual administrative errors.
• Remote Access: Enabling distance learning for rural colleges.

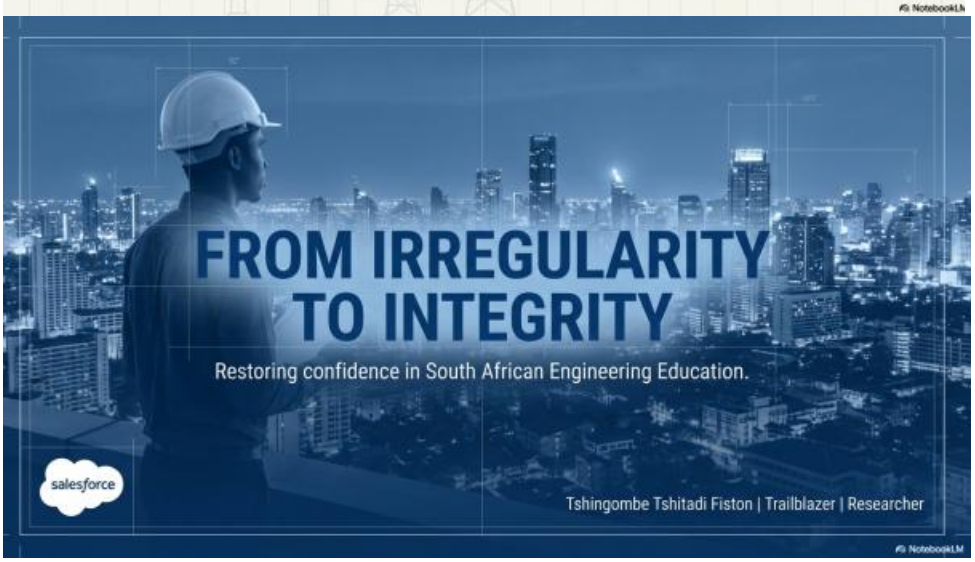

INDUSTRY ALIGNMENT & WORK-INTEGRATED LEARNING
ESKOM
CITY POWER
Schneider Electric
EATON
THE GAP
Students graduating without job readiness.
THE FIX
Mandatory industrial placement and digital logbooks.
THE LOOP
Industry experts acting as moderators and assessors.

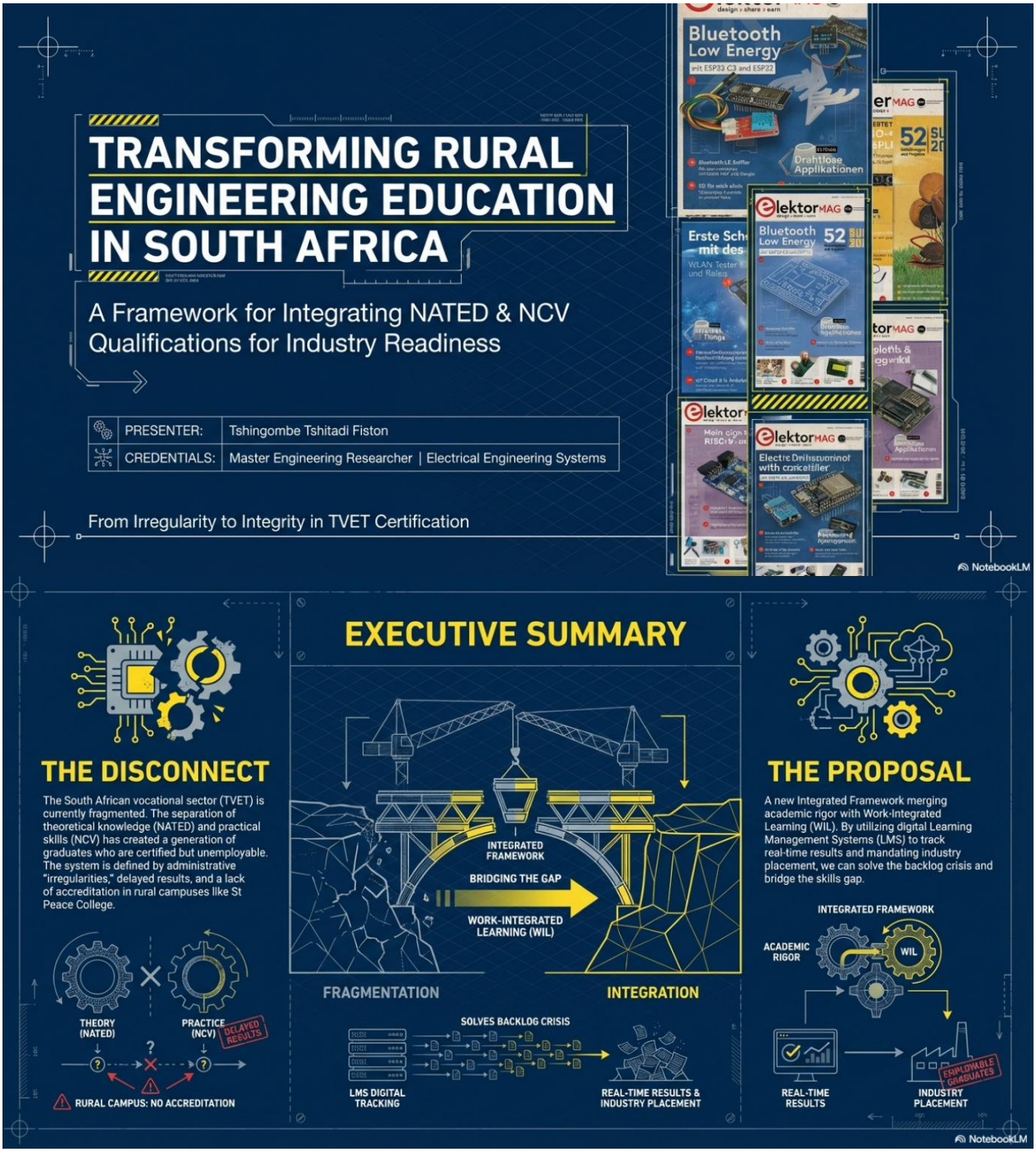
GOVERNANCE, RISK, AND COMPLIANCE (GRC)
STANDARDIZATION
ISO/SANS Standards & SAQA Accreditation
LABOR STABILITY
Fair compensation & Bargaining Council agreements.
SAFETY
OHSA (Occupational Health and Safety Act) compliance.

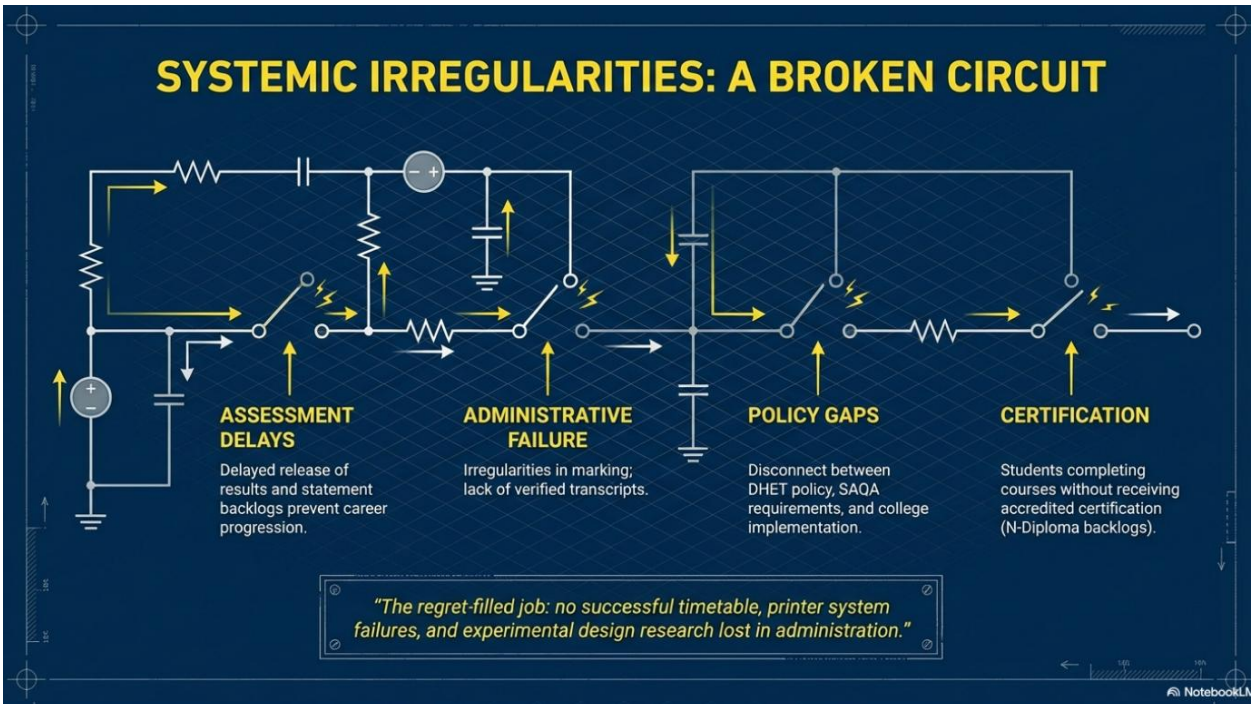

IMPLEMENTATION ROADMAP (5-YEAR PLAN)
YEAR 1
YEAR 2-3
YEAR 4
YEAR 5
EXPEDITIONER
Policy Review & Framework Design.
Pilot Programs in Rural Colleges (St Peace College).
LMS Integration & Digital Systems.
National Rollout & Accreditation.

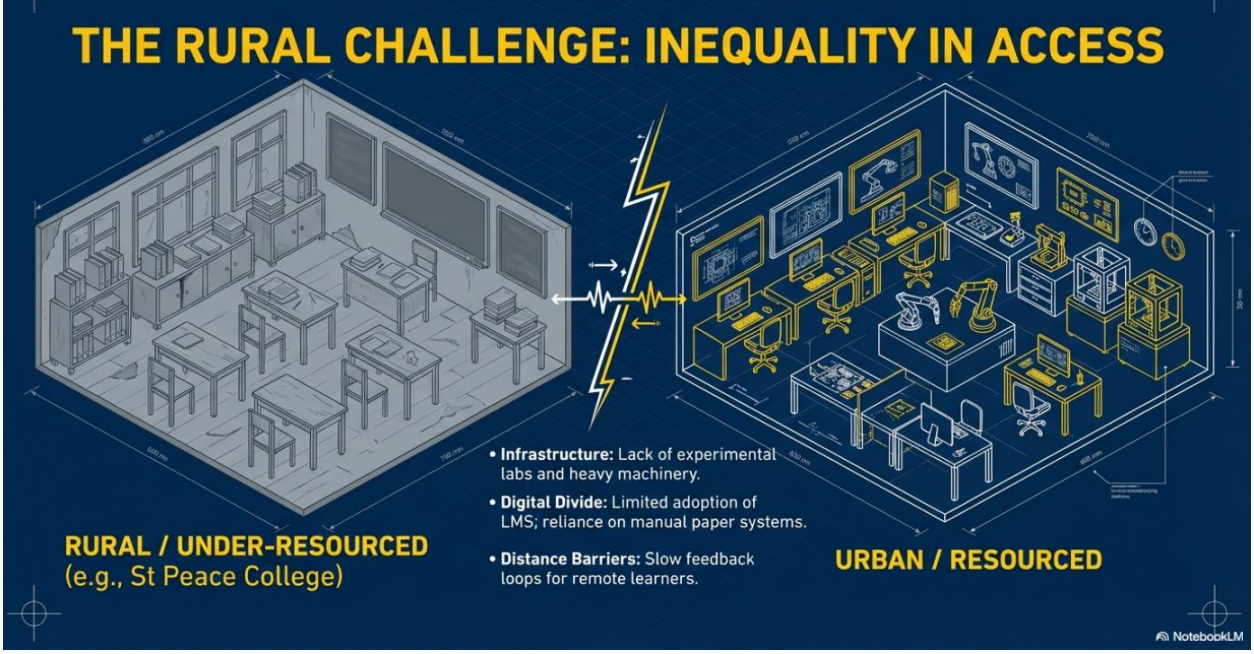

EXPECTED OUTCOMES & BENEFITS
CURRENT STATE
Backlogs
Missing Marks
Labor Disputes
Unemployable Graduates
FUTURE STATE
Timely Certification
Verified Results
Labor Stability
Skilled Energy Workforce
Stabilizing the Energy Sector & Empowering Rural Economies

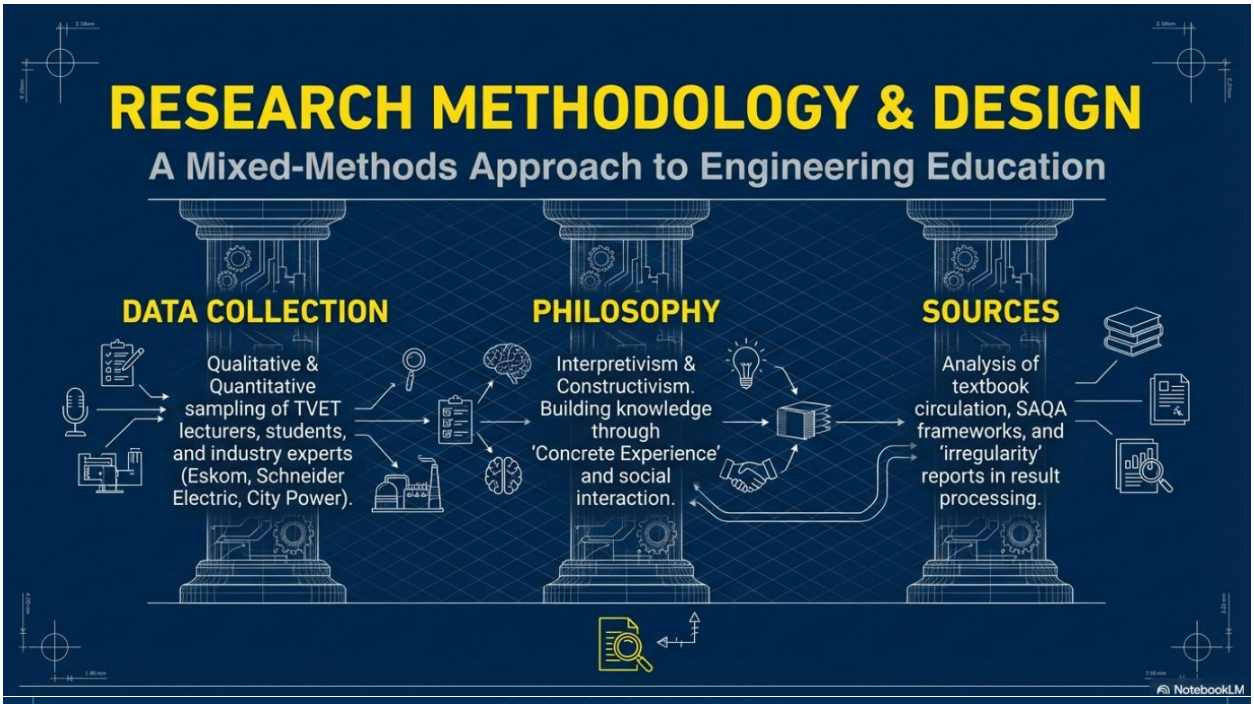

RESOURCE REQUIREMENTS & FUNDING
TRAINING
(Lecturer development)
20%
EQUIPMENT
(Simulators, Microgrid components)
45%
35%
DIGITAL INFRASTRUCTURE
(LMS, Cloud Storage)
FUNDING REQUEST
TARGET:
National Skills Fund (NSF) / NRF
BASE BUDGET UNIT:
40,000.00
PARTNERS:
DHET, SAQA, Private Energy Sector.
Securing sustainable resources and strategic partnerships for long-term impact.

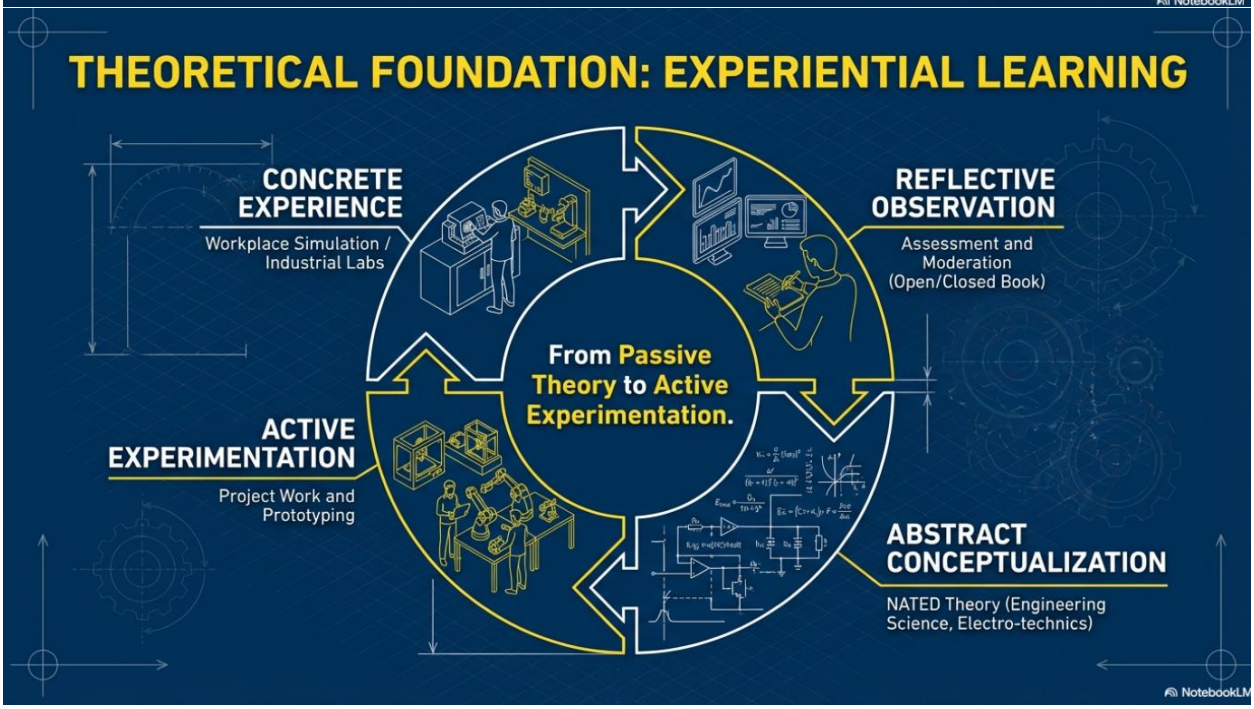

FROM IRREGULARITY TO INTEGRITY
Restoring confidence in South African Engineering Education.
salesforce
Tshingombe Tshitadi Fiston | Trailblazer | Researcher

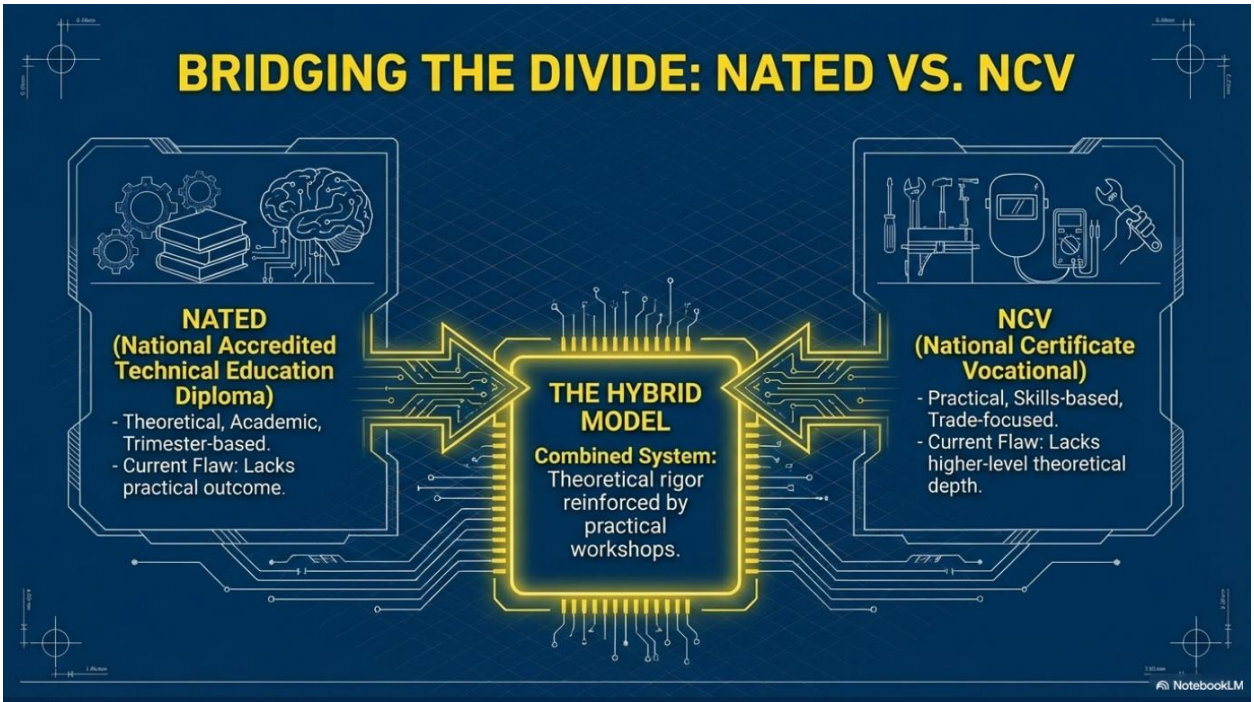

TRANSFORMING RURAL ENGINEERING EDUCATION IN SOUTH AFRICA
A Framework for Integrating NATED & NCV Qualifications for Industry Readiness
PRESENTER: Tshingombe Tshitadi Fiston
CREDENTIALS: Master Engineering Researcher | Electrical Engineering Systems
From Irregularity to Integrity in TVET Certification
NotebookLM
EXECUTIVE SUMMARY
THE DISCONNECT
The South African vocational sector (TVET) is currently fragmented. The separation of theoretical knowledge (NATED) and practical skills (NCV) has created a generation of graduates who are certified but unemployable. The system is defined by administrative "irregularities," delayed results, and a lack of accreditation in rural campuses like St Peace College.
THEORY (NATED)
PRACTICE (NCV)
DELAYED RESULTS
RURAL CAMPUS: NO ACCREDITATION
INTEGRATED FRAMEWORK
BRIDGING THE GAP
WORK-INTEGRATED LEARNING (WIL)
FRAGMENTATION
INTEGRATION
SOLVES BACKLOG CRISIS
LMS DIGITAL TRACKING
REAL-TIME RESULTS & INDUSTRY PLACEMENT
THE PROPOSAL
A new Integrated Framework merging academic rigor with Work-Integrated Learning (WIL). By utilizing digital Learning Management Systems (LMS) to track real-time results and mandating industry placement, we can solve the backlog crisis and bridge the skills gap.
INTEGRATED FRAMEWORK
ACADEMIC RIGOR
WIL
REAL-TIME RESULTS
INDUSTRY PLACEMENT
EMPLOYABLE GRADUATES
NotebookLM

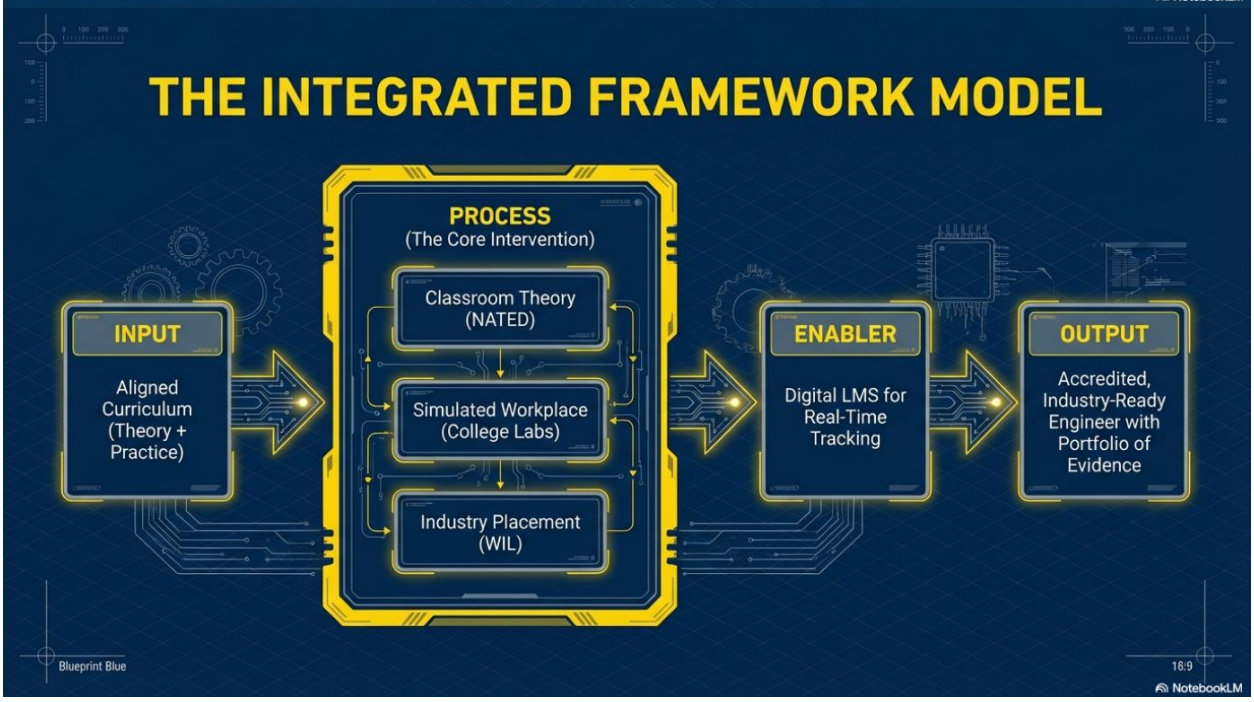

SYSTEMIC IRREGULARITIES: A BROKEN CIRCUIT
ASSESSMENT DELAYS
Delayed release of results and statement backlogs prevent career progression.
ADMINISTRATIVE FAILURE
Irregularities in marking; lack of verified transcripts.
POLICY GAPS
Disconnect between DHET policy, SAQA requirements, and college implementation.
CERTIFICATION
Students completing courses without receiving accredited certification (N-Diploma backlogs).
"The regret-filled job: no successful timetable, printer system failures, and experimental design research lost in administration."
NotebookLM

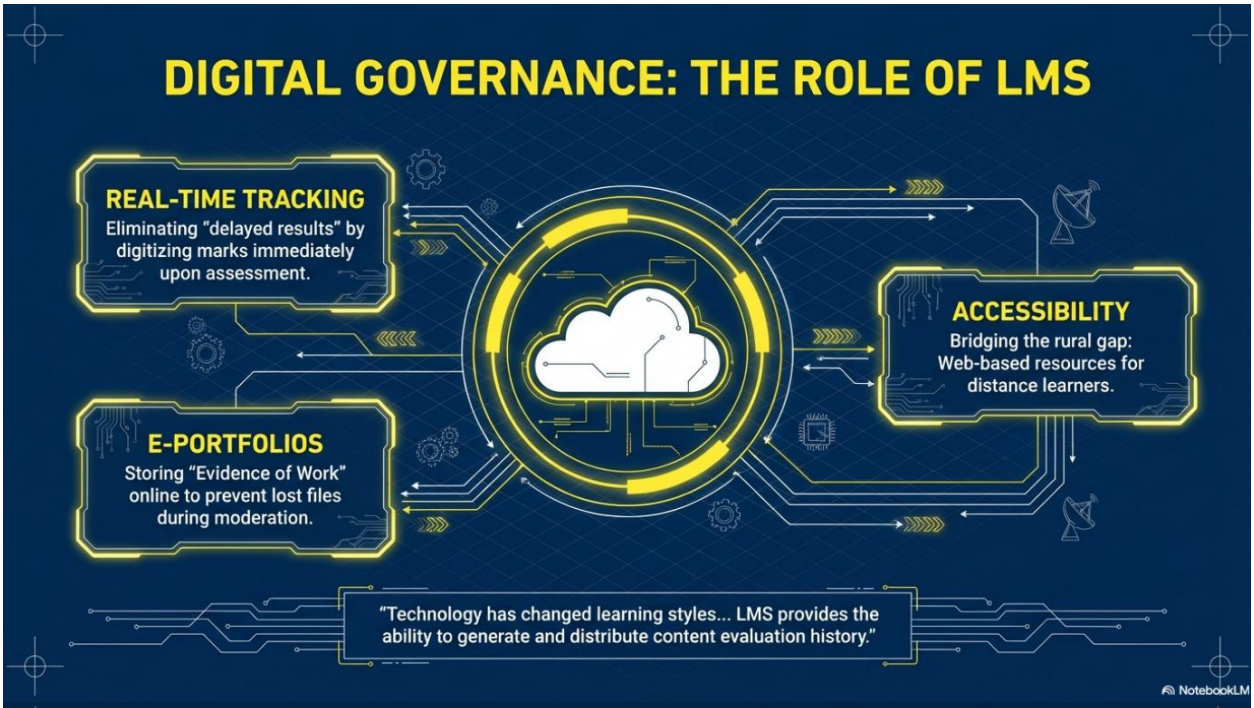

THE RURAL CHALLENGE: INEQUALITY IN ACCESS
• Infrastructure: Lack of experimental labs and heavy machinery.
• Digital Divide: Limited adoption of LMS; reliance on manual paper systems.
• Distance Barriers: Slow feedback loops for remote learners.
RURAL / UNDER-RESOURCED
(e.g., St Peace College)
URBAN / RESOURCED
NotebookLM

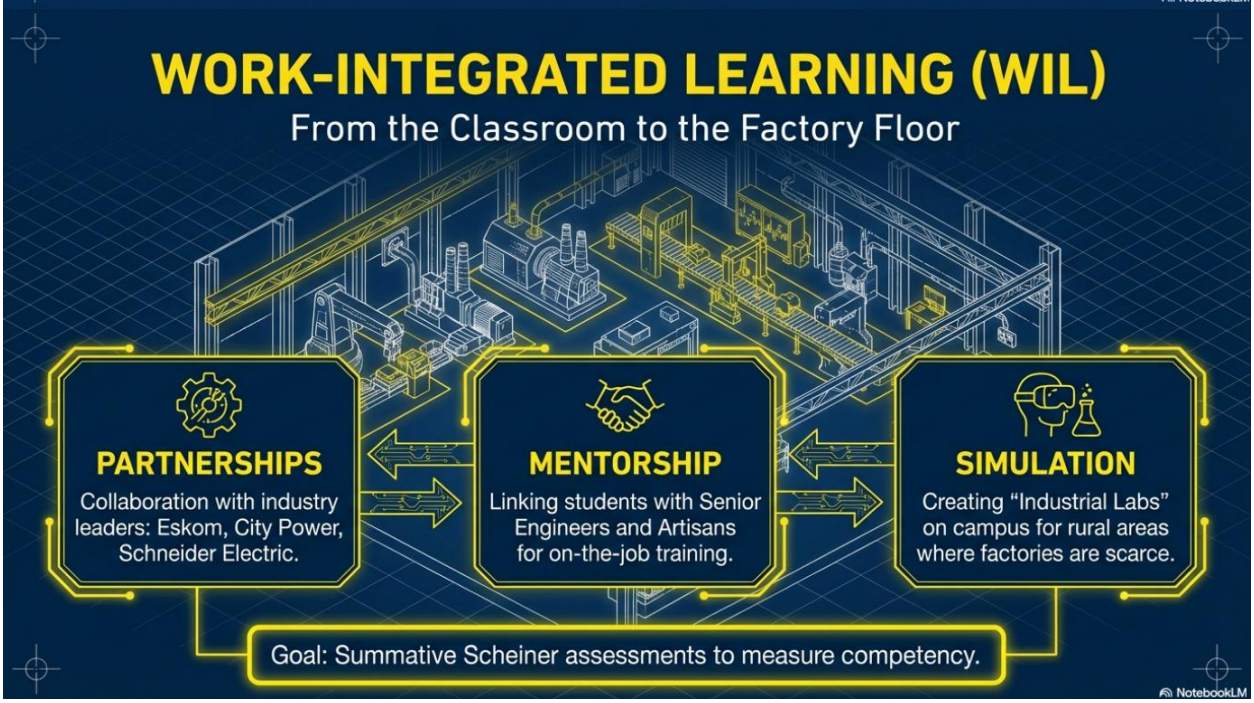

RESEARCH METHODOLOGY & DESIGN
A Mixed-Methods Approach to Engineering Education
DATA COLLECTION
Qualitative & Quantitative sampling of TVET lecturers, students, and industry experts (Eskom, Schneider Electric, City Power).
PHILOSOPHY
Interpretivism & Constructivism. Building knowledge through 'Concrete Experience' and social interaction.
SOURCES
Analysis of textbook circulation, SAQA frameworks, and 'irregularity' reports in result processing.
NotebookLM

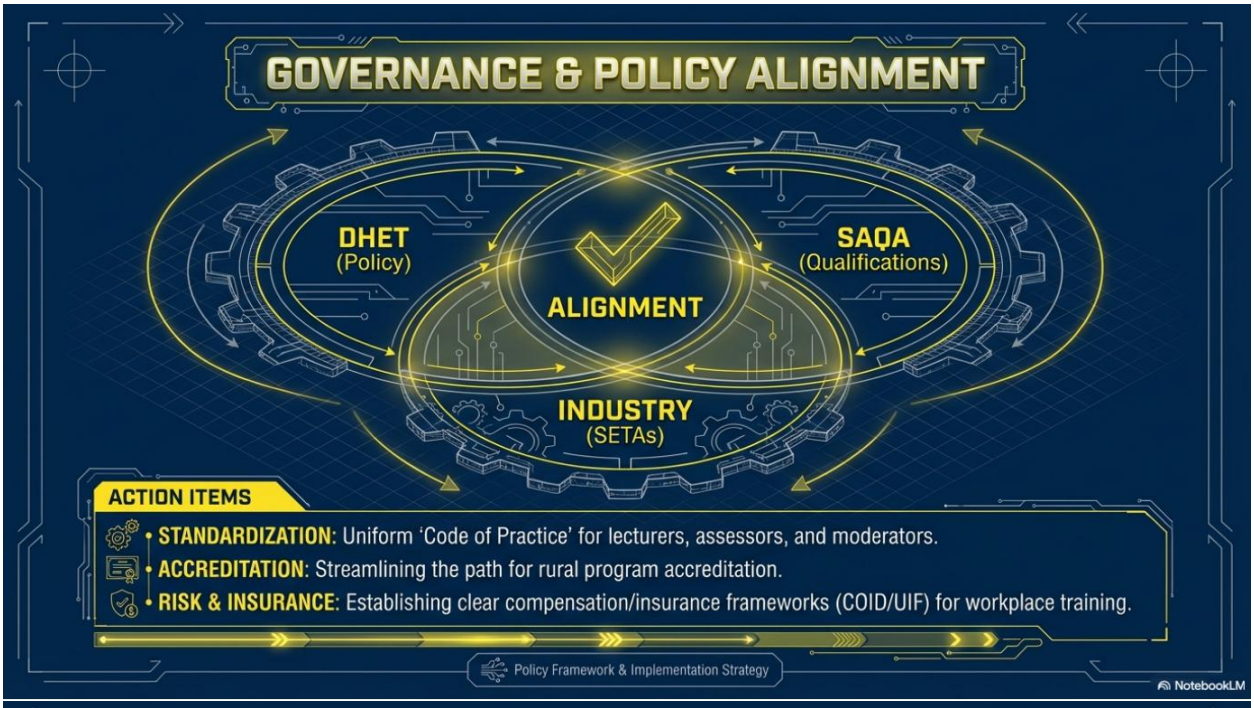

THEORETICAL FOUNDATION: EXPERIENTIAL LEARNING
CONCRETE EXPERIENCE
Workplace Simulation / Industrial Labs
REFLECTIVE OBSERVATION
Assessment and Moderation (Open/Closed Book)
From Passive Theory to Active Experimentation.
ACTIVE EXPERIMENTATION
Project Work and Prototyping
ABSTRACT CONCEPTUALIZATION
NATED Theory (Engineering Science, Electro-technics)
NotebookLM

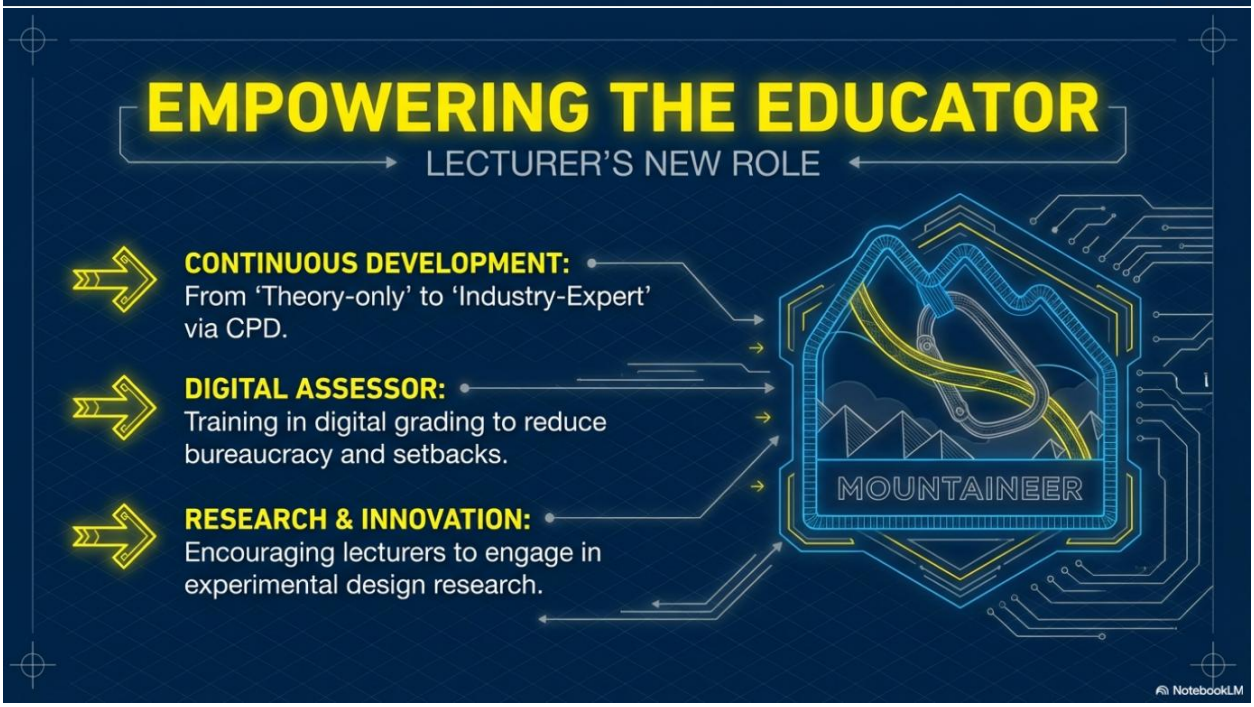

BRIDGING THE DIVIDE: NATED VS. NCV
NATED
(National Accredited Technical Education Diploma)
- Theoretical, Academic, Trimester-based.
- Current Flaw: Lacks practical outcome.
THE HYBRID MODEL
Combined System: Theoretical rigor reinforced by practical workshops.
NCV
(National Certificate Vocational)
- Practical, Skills-based, Trade-focused.
- Current Flaw: Lacks higher-level theoretical depth.
NotebookLM

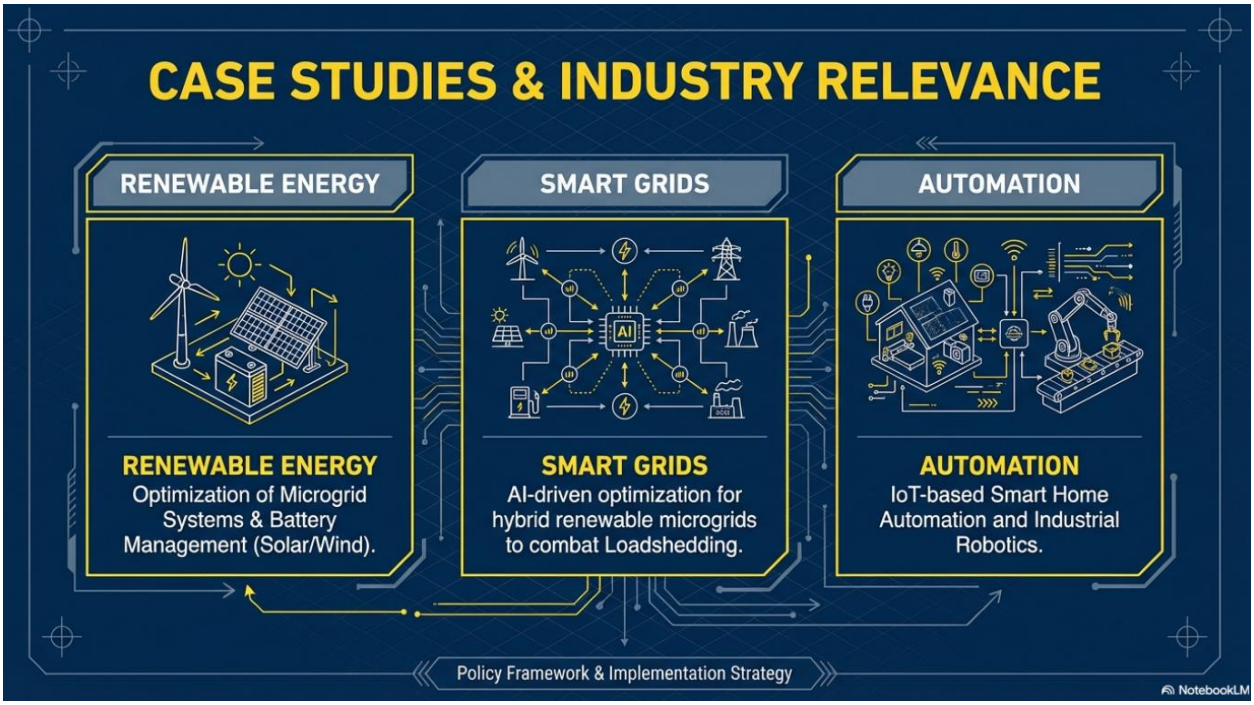

THE INTEGRATED FRAMEWORK MODEL
INPUT
Aligned Curriculum (Theory + Practice)
PROCESS
(The Core Intervention)
Classroom Theory (NATED)
Simulated Workplace (College Labs)
Industry Placement (WIL)
ENABLER
Digital LMS for Real-Time Tracking
OUTPUT
Accredited, Industry-Ready Engineer with Portfolio of Evidence
Blueprint Blue
16:9
NotebookLM

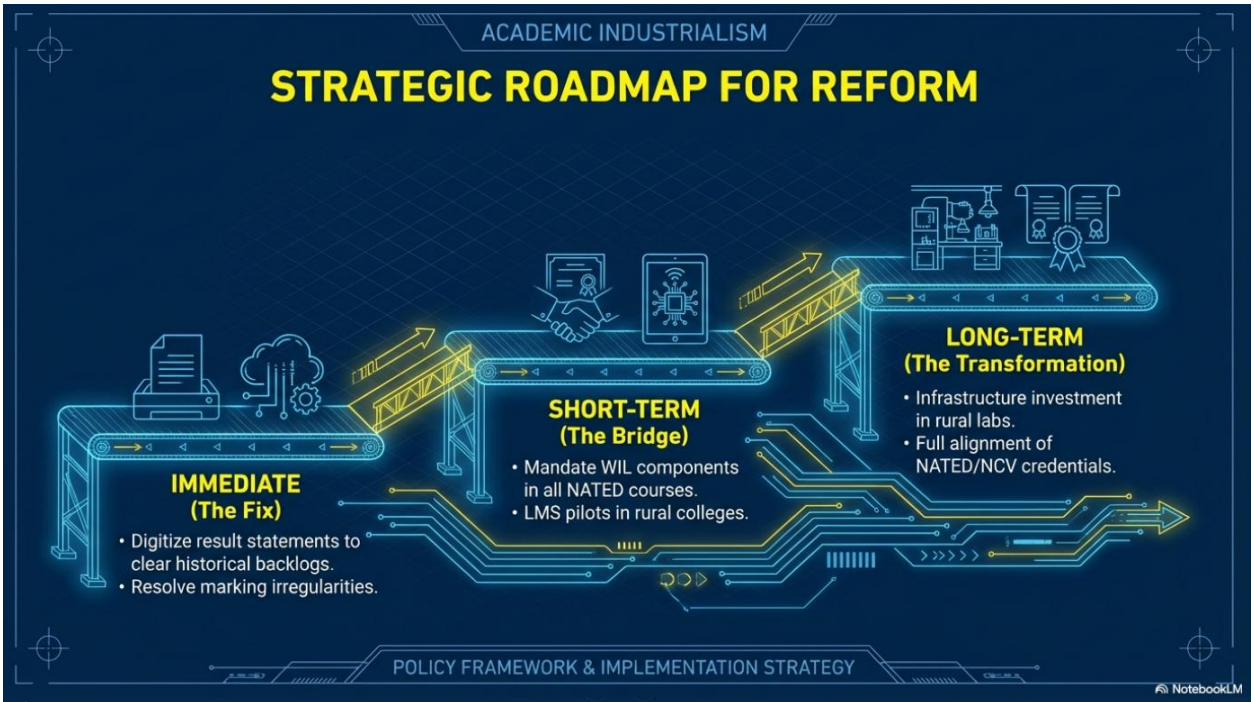

DIGITAL GOVERNANCE: THE ROLE OF LMS
REAL-TIME TRACKING
Eliminating "delayed results" by digitizing marks immediately upon assessment.
ACCESSIBILITY
Bridging the rural gap: Web-based resources for distance learners.
E-PORTFOLIOS
Storing "Evidence of Work" online to prevent lost files during moderation.
"Technology has changed learning styles... LMS provides the ability to generate and distribute content evaluation history."
NotebookLM

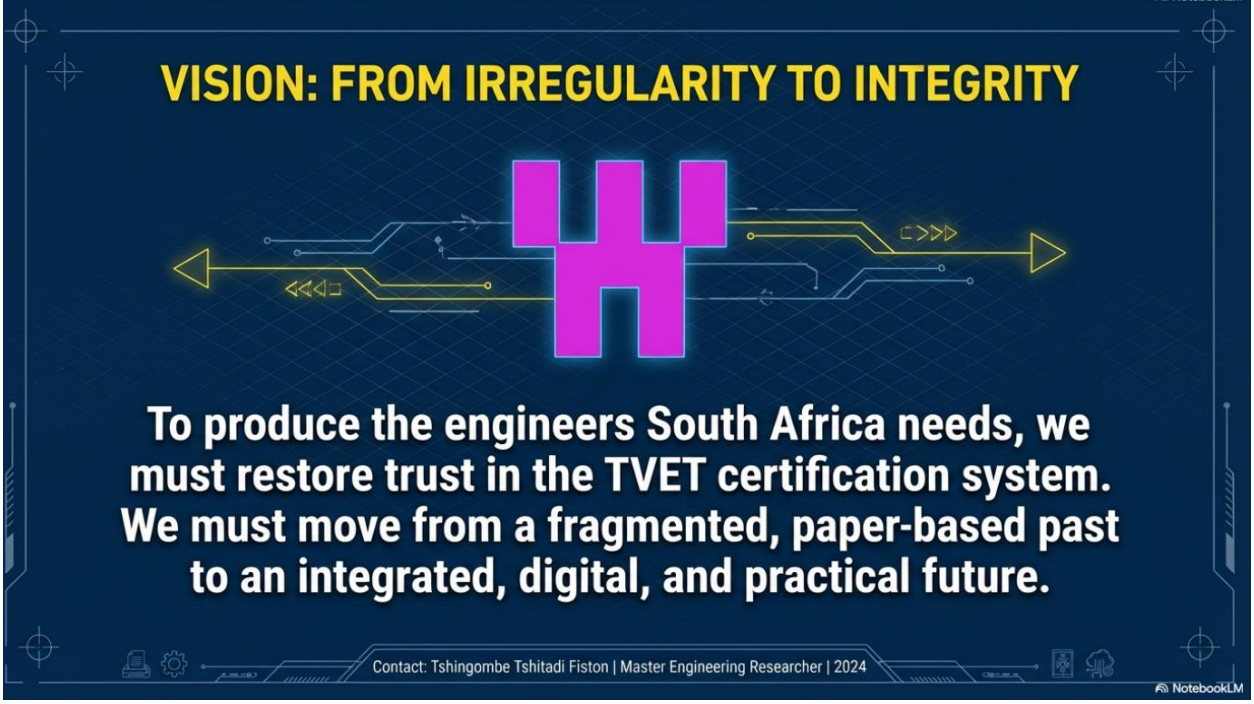

WORK-INTEGRATED LEARNING (WIL)
From the Classroom to the Factory Floor
PARTNERSHIPS
Collaboration with industry leaders: Eskom, City Power, Schneider Electric.
MENTORSHIP
Linking students with Senior Engineers and Artisans for on-the-job training.
SIMULATION
Creating "Industrial Labs" on campus for rural areas where factories are scarce.
Goal: Summative Scheiner assessments to measure competency.
NotebookLM


GOVERNANCE & POLICY ALIGNMENT
DHET
(Policy)
SAQA
(Qualifications)
ALIGNMENT
INDUSTRY
(SETAs)
ACTION ITEMS
STANDARDIZATION: Uniform 'Code of Practice' for lecturers, assessors, and moderators.
ACCREDITATION: Streamlining the path for rural program accreditation.
RISK & INSURANCE: Establishing clear compensation/insurance frameworks (COID/UIF) for workplace training.
Policy Framework & Implementation Strategy
NotebookLM

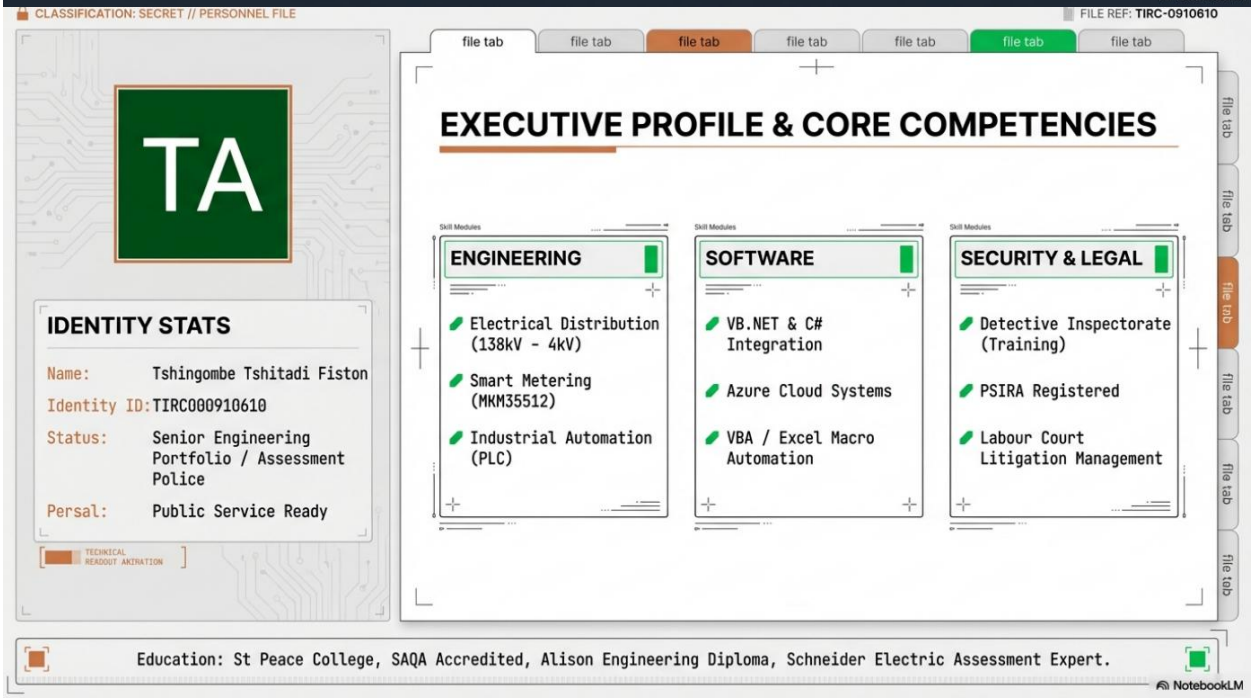

EMPOWERING THE EDUCATOR
LECTURER'S NEW ROLE
CONTINUOUS DEVELOPMENT:
From 'Theory-only' to 'Industry-Expert' via CPD.
DIGITAL ASSESSOR:
Training in digital grading to reduce bureaucracy and setbacks.
RESEARCH & INNOVATION:
Encouraging lecturers to engage in experimental design research.
MOUNTAINEER
NotebookLM

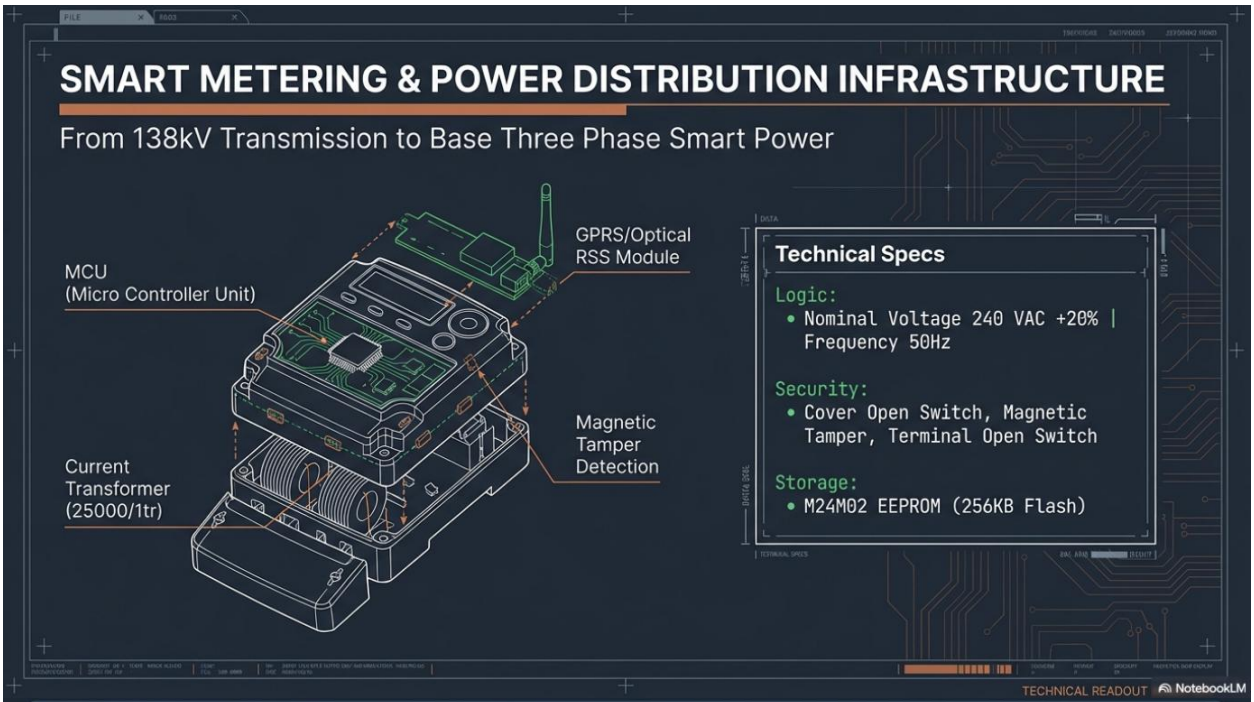

CASE STUDIES & INDUSTRY RELEVANCE
RENEWABLE ENERGY
SMART GRIDS
AUTOMATION
AI
RENEWABLE ENERGY
Optimization of Microgrid Systems & Battery Management (Solar/Wind).
SMART GRIDS
AI-driven optimization for hybrid renewable microgrids to combat Loadshedding.
AUTOMATION
IoT-based Smart Home Automation and Industrial Robotics.
Policy Framework & Implementation Strategy
NotebookLM

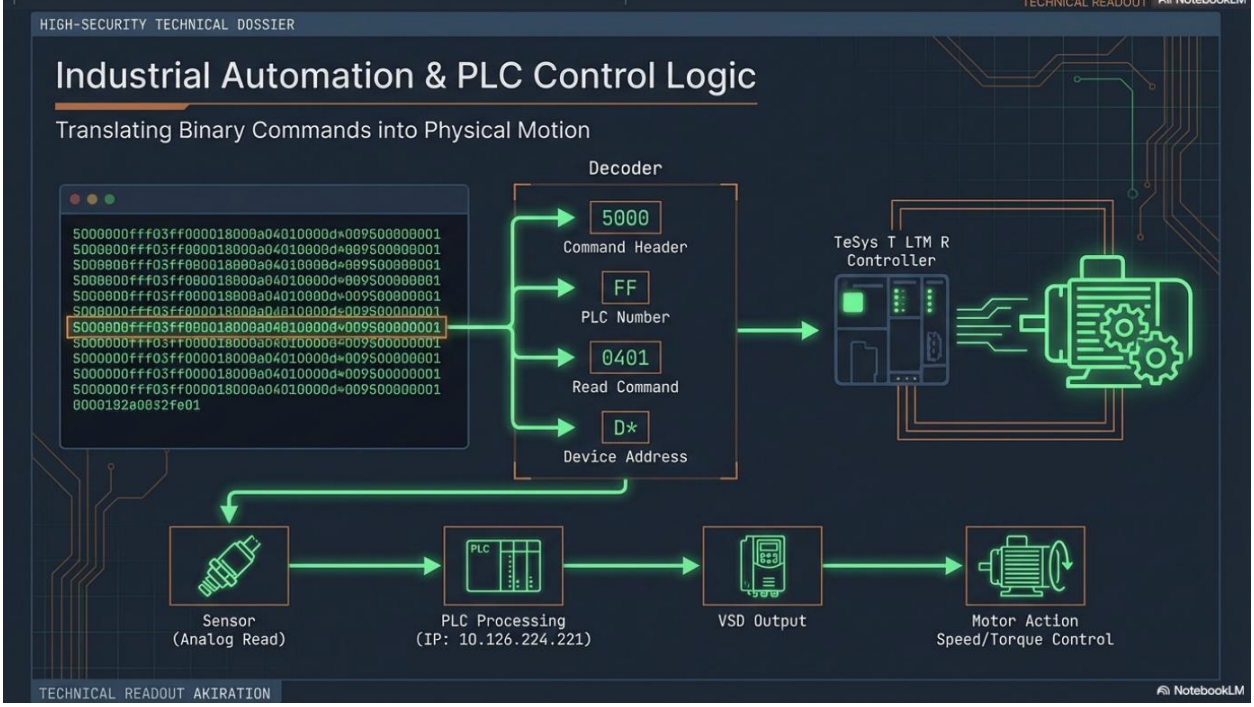

ACADEMIC INDUSTRIALISM
STRATEGIC ROADMAP FOR REFORM
IMMEDIATE
(The Fix)
• Digitize result statements to clear historical backlogs.
• Resolve marking irregularities.
SHORT-TERM
(The Bridge)
• Mandate WIL components in all NATED courses.
• LMS pilots in rural colleges.
LONG-TERM
(The Transformation)
• Infrastructure investment in rural labs.
• Full alignment of NATED/NCV credentials.
POLICY FRAMEWORK & IMPLEMENTATION STRATEGY
NotebookLM

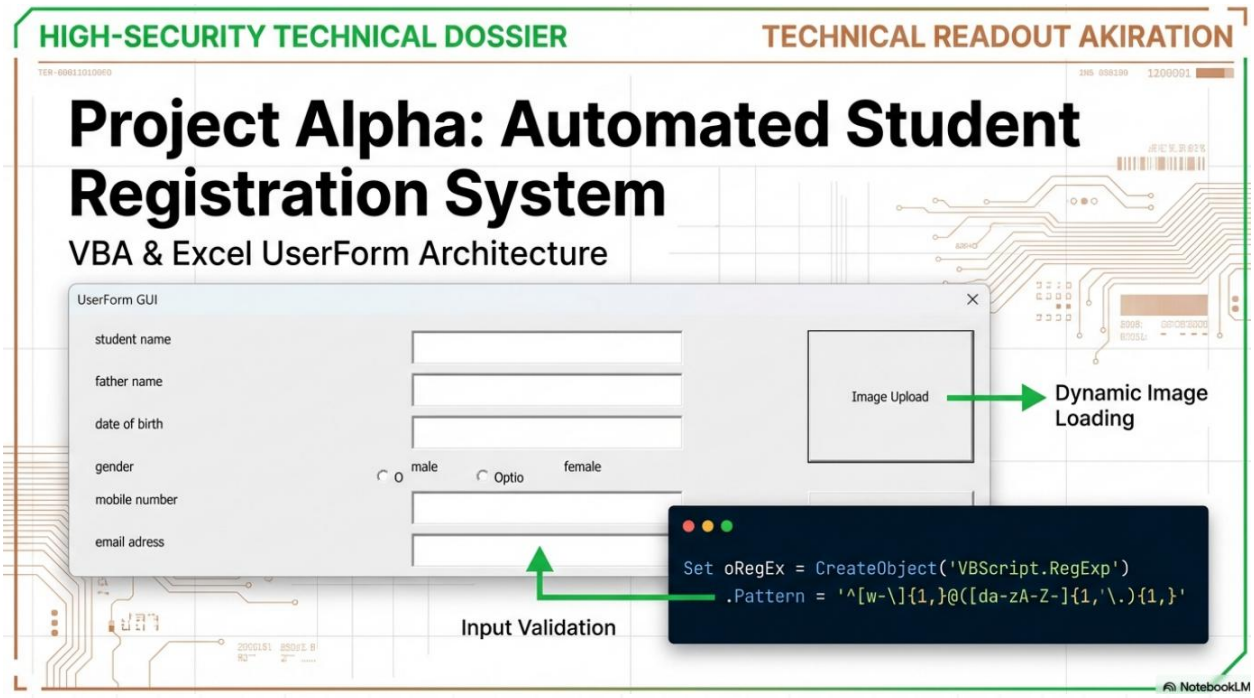

VISION: FROM IRREGULARITY TO INTEGRITY
To produce the engineers South Africa needs, we must restore trust in the TVET certification system. We must move from a fragmented, paper-based past to an integrated, digital, and practical future.
Contact: Tshingombe Tshitadi Fiston | Master Engineering Researcher | 2024
NotebookLM

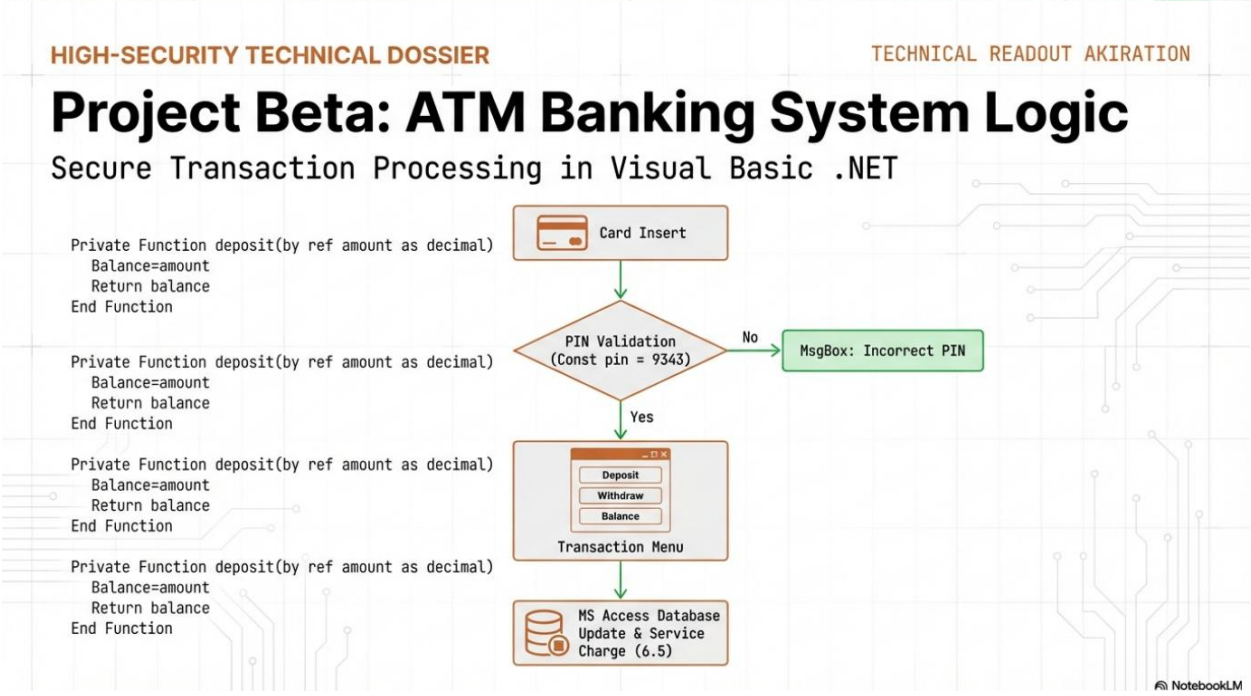
HIGH-SECURITY CLEARANCE
CLASSIFICATION
MULTIDISCIPLINARY PORTFOLIO: ENGINEERING, SYSTEMS DEVELOPMENT & SECURITY ADMINISTRATION
The Professional Dossier of Tshingombe Tshitadi Fiston
TA
Bridging the gap between High-Voltage Infrastructure, Algorithmic Logic, and Regulatory Law Enforcement.
TECHNICAL DOSSIER
NotebookLM


CLASSIFICATION: SECRET // PERSONNEL FILE
FILE REF: TIRC-0910610
TA
IDENTITY STATS
Name: Tshingombe Tshitadi Fiston
Identity ID: TIRC000910610
Status: Senior Engineering Portfolio / Assessment Police
Persal: Public Service Ready
file tab
EXECUTIVE PROFILE & CORE COMPETENCIES
ENGINEERING
Electrical Distribution (138kV - 4kV)
Smart Metering (MKM35512)
Industrial Automation (PLC)
SOFTWARE
VB.NET & C# Integration
Azure Cloud Systems
VBA / Excel Macro Automation
SECURITY & LEGAL
Detective Inspectorate (Training)
PSIRA Registered
Labour Court Litigation Management
Education: St Peace College, SAQA Accredited, Alison Engineering Diploma, Schneider Electric Assessment Expert.
NotebookLM

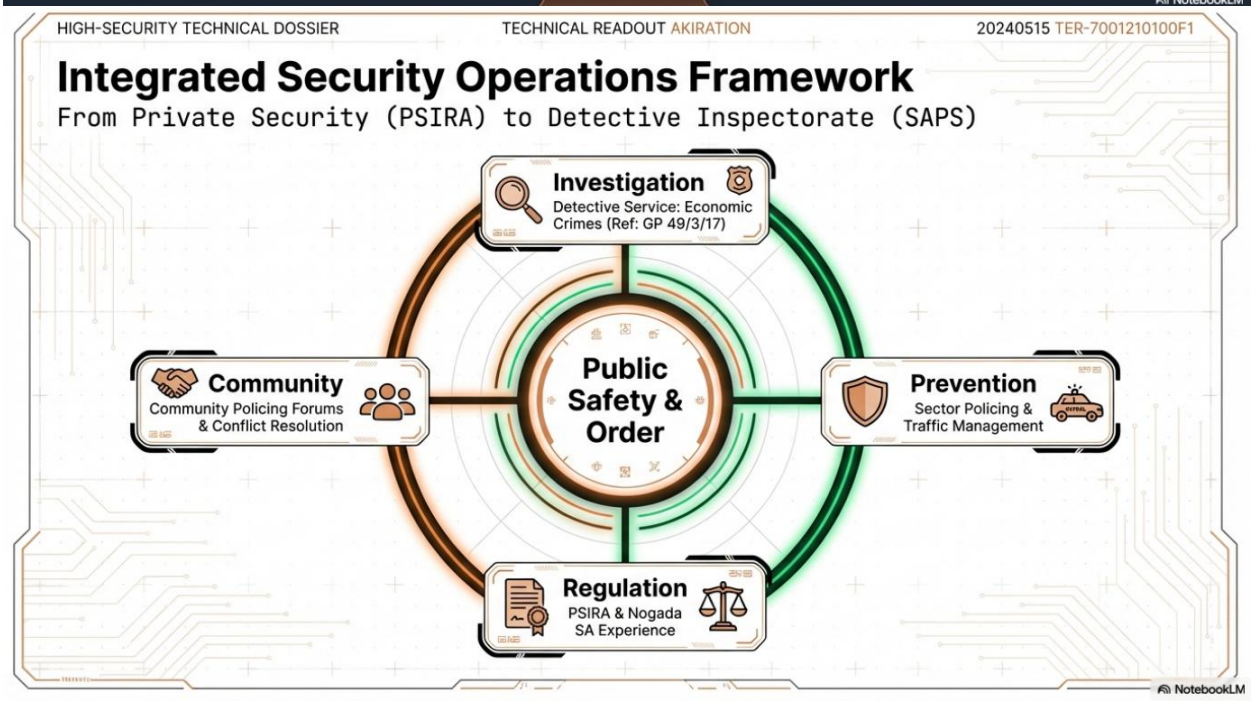

SMART METERING & POWER DISTRIBUTION INFRASTRUCTURE
From 138kV Transmission to Base Three Phase Smart Power
MCU
(Micro Controller Unit)
GPRS/Optical
RSS Module
Current
Transformer
(25000/1tr)
Magnetic
Tamper
Detection
Technical Specs
Logic:
• Nominal Voltage 240 VAC +20% | Frequency 50Hz
Security:
• Cover Open Switch, Magnetic Tamper, Terminal Open Switch
Storage:
• M24M02 EEPROM (256KB Flash)
TECHNICAL READOUT
NotebookLM


HIGH-SECURITY TECHNICAL DOSSIER
Industrial Automation & PLC Control Logic
Translating Binary Commands into Physical Motion
Decoder
5000
Command Header
FF
PLC Number
0401
Read Command
D*
Device Address
TeSys T LTM R
Controller
Sensor
(Analog Read)
PLC
PLC Processing
(IP: 10.126.224.221)
VSD Output
Motor Action
Speed/Torque Control
TECHNICAL READOUT AKIRATION
NotebookLM

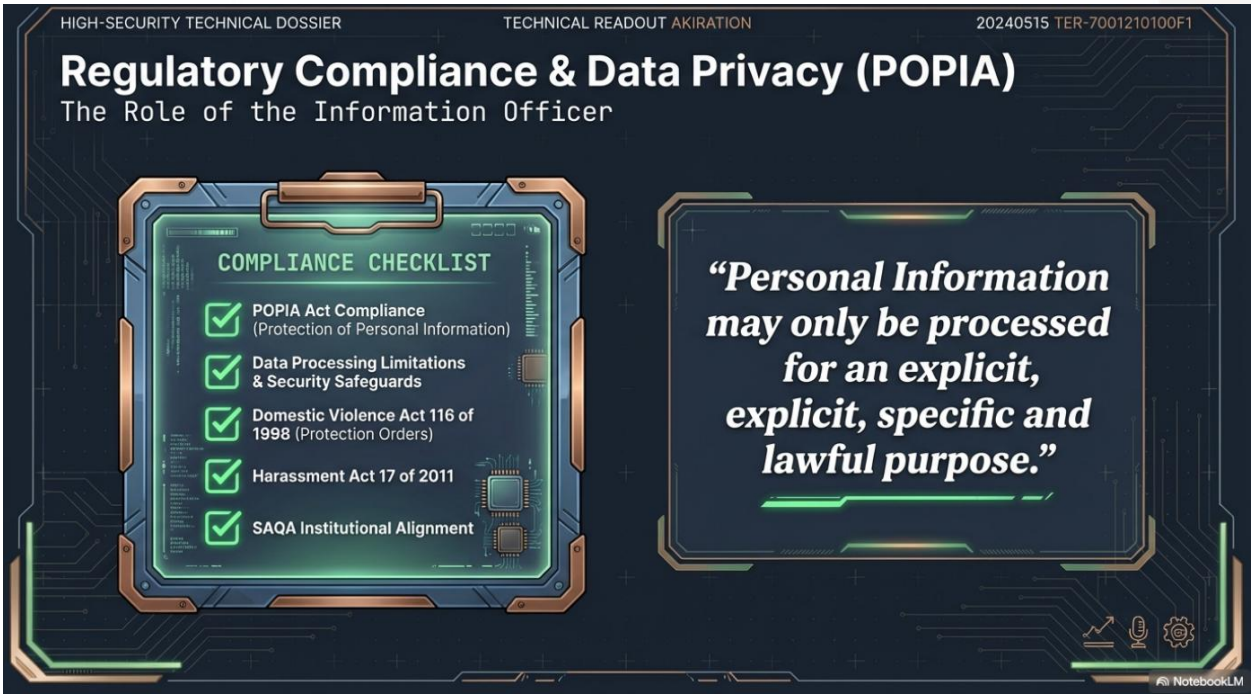

HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
Project Alpha: Automated Student Registration System
VBA & Excel UserForm Architecture
UserForm GUI
student name
father name
date of birth
gender
male
Optio
female
mobile number
email adress
Image Upload
Dynamic Image Loading
Set oRegEx = CreateObject('VBScript.RegExp')
.Pattern = '^[w-\]{1,}@([da-zA-Z-]{1,'\.){1,}'
Input Validation
NotebookLM

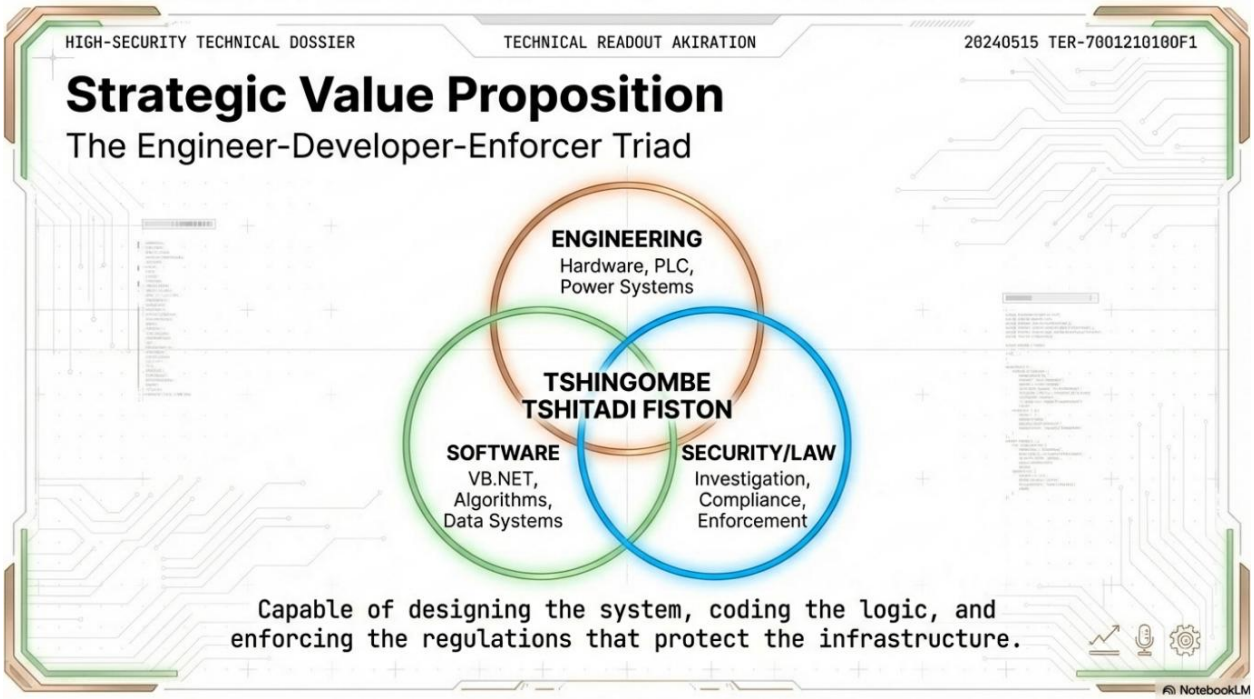

HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
Project Beta: ATM Banking System Logic
Secure Transaction Processing in Visual Basic .NET
Private Function deposit(by ref amount as decimal)
Balance=amount
Return balance
End Function
Private Function deposit(by ref amount as decimal)
Balance=amount
Return balance
End Function
Private Function deposit(by ref amount as decimal)
Balance=amount
Return balance
End Function
Private Function deposit(by ref amount as decimal)
Balance=amount
Return balance
End Function
Card Insert
PIN Validation
(Const pin = 9343)
No
MsgBox: Incorrect PIN
Yes
Deposit
Withdraw
Balance
Transaction Menu
MS Access Database
Update & Service
Charge (6.5)
NotebookLM

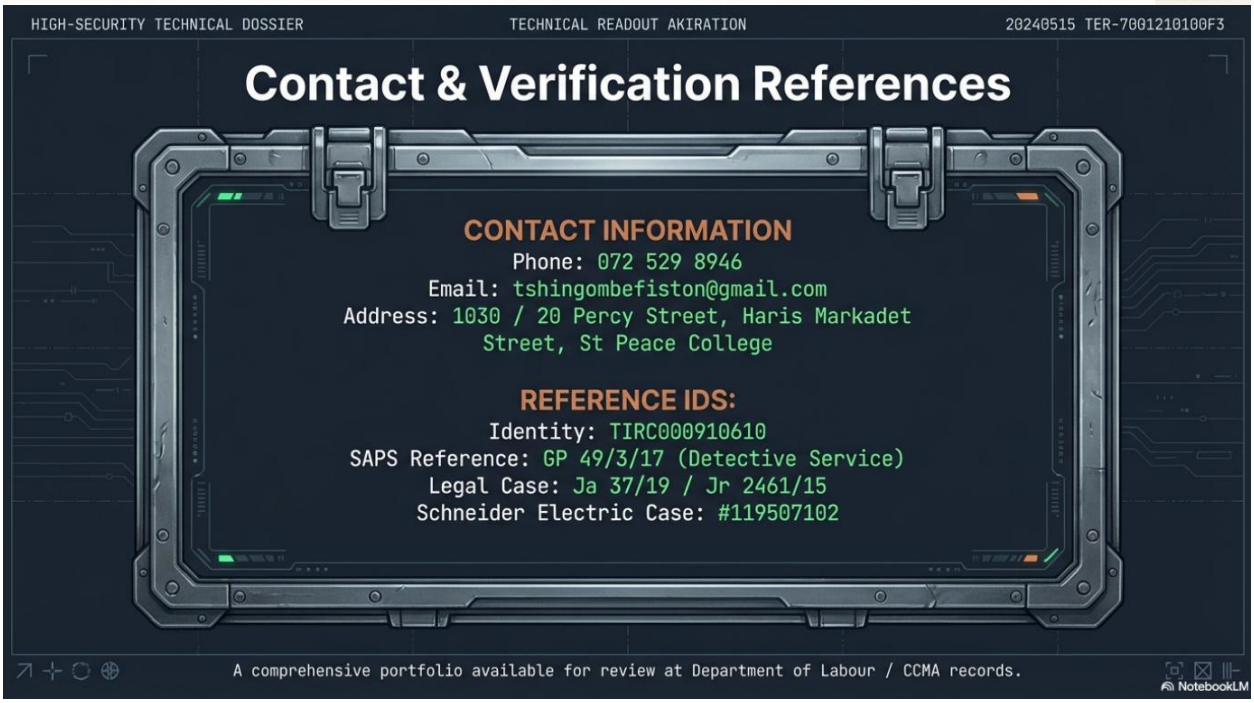
HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F1
Project Gamma: Web-Based Crime Management System (MIS)
Digital Tools for Samara City Police Station
Police Command Dashboard
Criminal Record Center
Management System Information
Applied Policing and Crime Resolution
Principles of Police Investigation
Hotspots
Samara
Strategic Priorities
Crime Prevention
Traffic Safety
Community Engagement
Transition from manual paper files to digital information systems.
NotebookLM

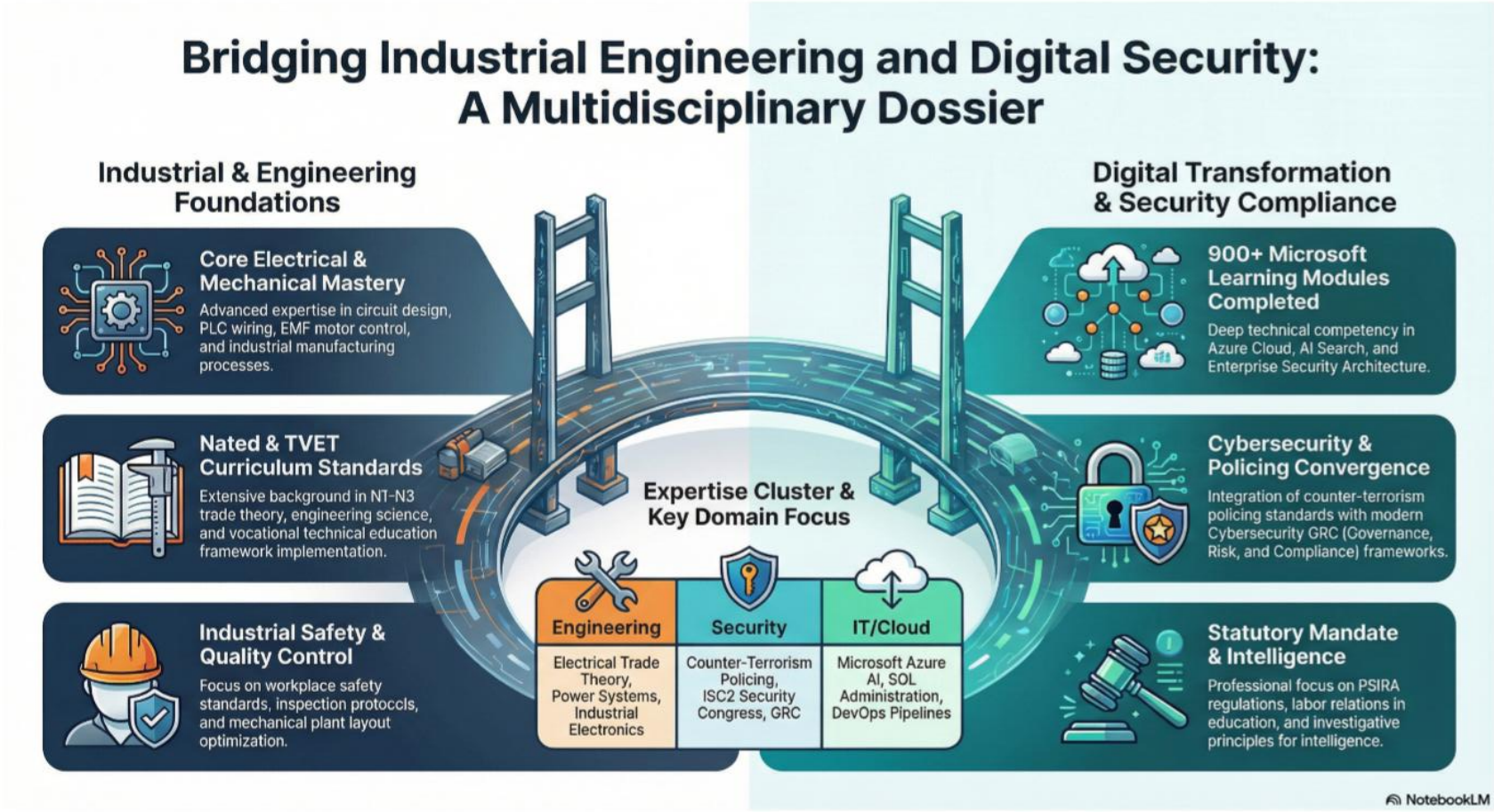

HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F1
Integrated Security Operations Framework
From Private Security (PSIRA) to Detective Inspectorate (SAPS)
Investigation
Detective Service: Economic Crimes (Ref: GP 49/3/17)
Community
Community Policing Forums & Conflict Resolution
Public Safety & Order
Prevention
Sector Policing & Traffic Management
Regulation
PSIRA & Nogada SA Experience
NotebookLM

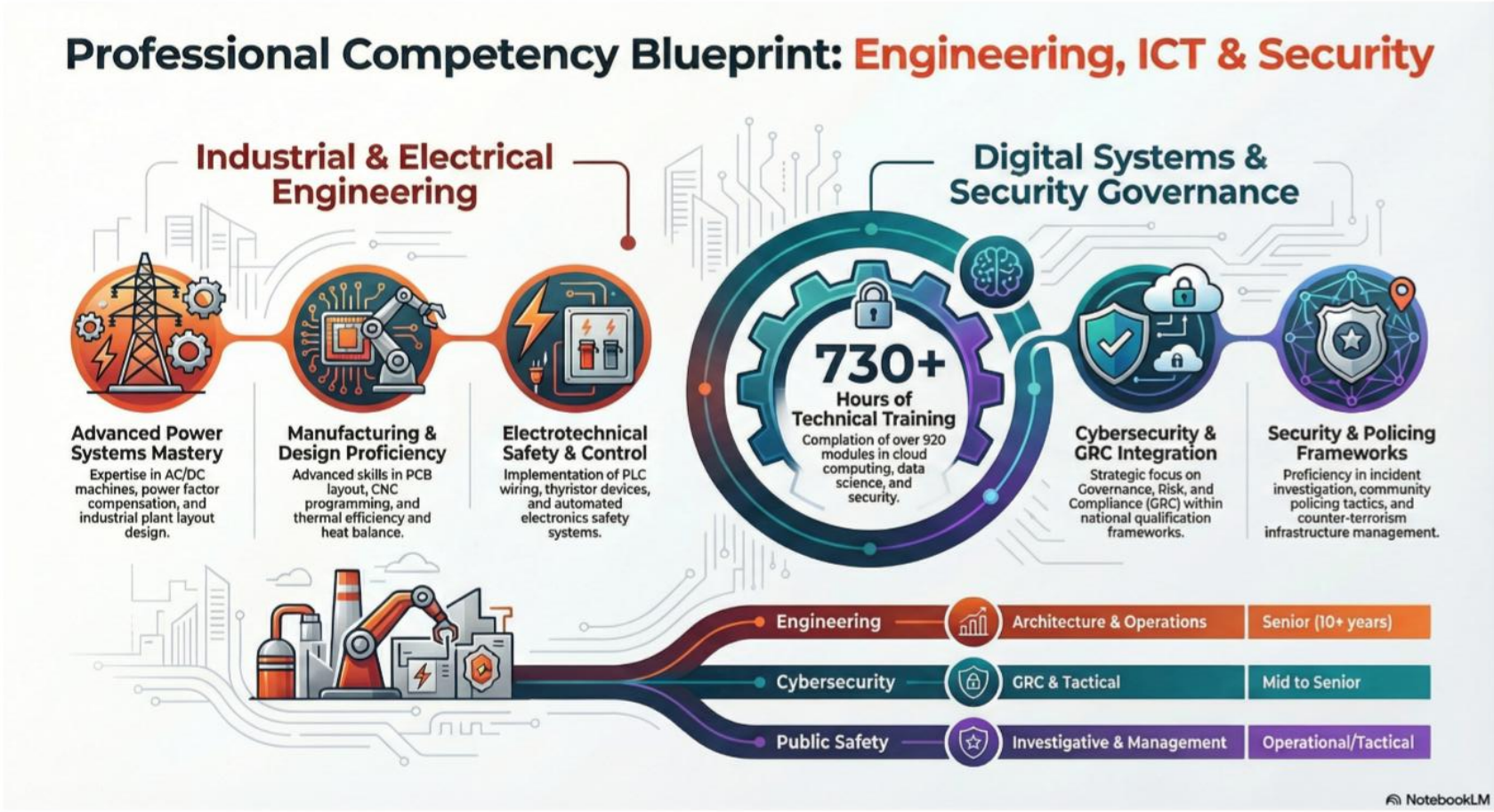
HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F1
Legal Standing & Administrative Resolution
Procedural History in the Labour Court of South Africa
2015
Case Jr 2461/15
(Referral/Dispute)
2019
Case Ja 37/19
(Appeal Process)
Case Ja 37/19
(Appeal Process)
2024
Civil Litigation
(Case 1042024CIV004539)
Current
Leave to Appeal &
Rescission Rulings
Leave to Appeal &
Rescission Rulings
Self-representation in High Court and Labour Appeal Court demonstrating
procedural knowledge of the Department of Justice protocols.
NotebookLM


HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F1
Regulatory Compliance & Data Privacy (POPIA)
The Role of the Information Officer
COMPLIANCE CHECKLIST
POPIA Act Compliance
(Protection of Personal Information)
Data Processing Limitations
& Security Safeguards
Domestic Violence Act 116 of
1998 (Protection Orders)
Harassment Act 17 of 2011
SAQA Institutional Alignment
"Personal Information
may only be processed
for an explicit,
explicit, specific and
lawful purpose."
NotebookLM


HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F1
Strategic Value Proposition
The Engineer-Developer-Enforcer Triad
ENGINEERING
Hardware, PLC, Power Systems
TSHINGOMBE TSHITADI FISTON
SOFTWARE
VB.NET, Algorithms, Data Systems
SECURITY/LAW
Investigation, Compliance, Enforcement
Capable of designing the system, coding the logic, and enforcing the regulations that protect the infrastructure.
NotebookLM


HIGH-SECURITY TECHNICAL DOSSIER
TECHNICAL READOUT AKIRATION
20240515 TER-7001210100F3
Contact & Verification References
CONTACT INFORMATION
Phone: 072 529 8946
Email: tshingombefiston@gmail.com
Address: 1030 / 20 Percy Street, Haris Markadet Street, St Peace College
REFERENCE IDS:
Identity: TIRC000910610
SAPS Reference: GP 49/3/17 (Detective Service)
Legal Case: Ja 37/19 / Jr 2461/15
Schneider Electric Case: #119507102
A comprehensive portfolio available for review at Department of Labour / CCMA records.
NotebookLM

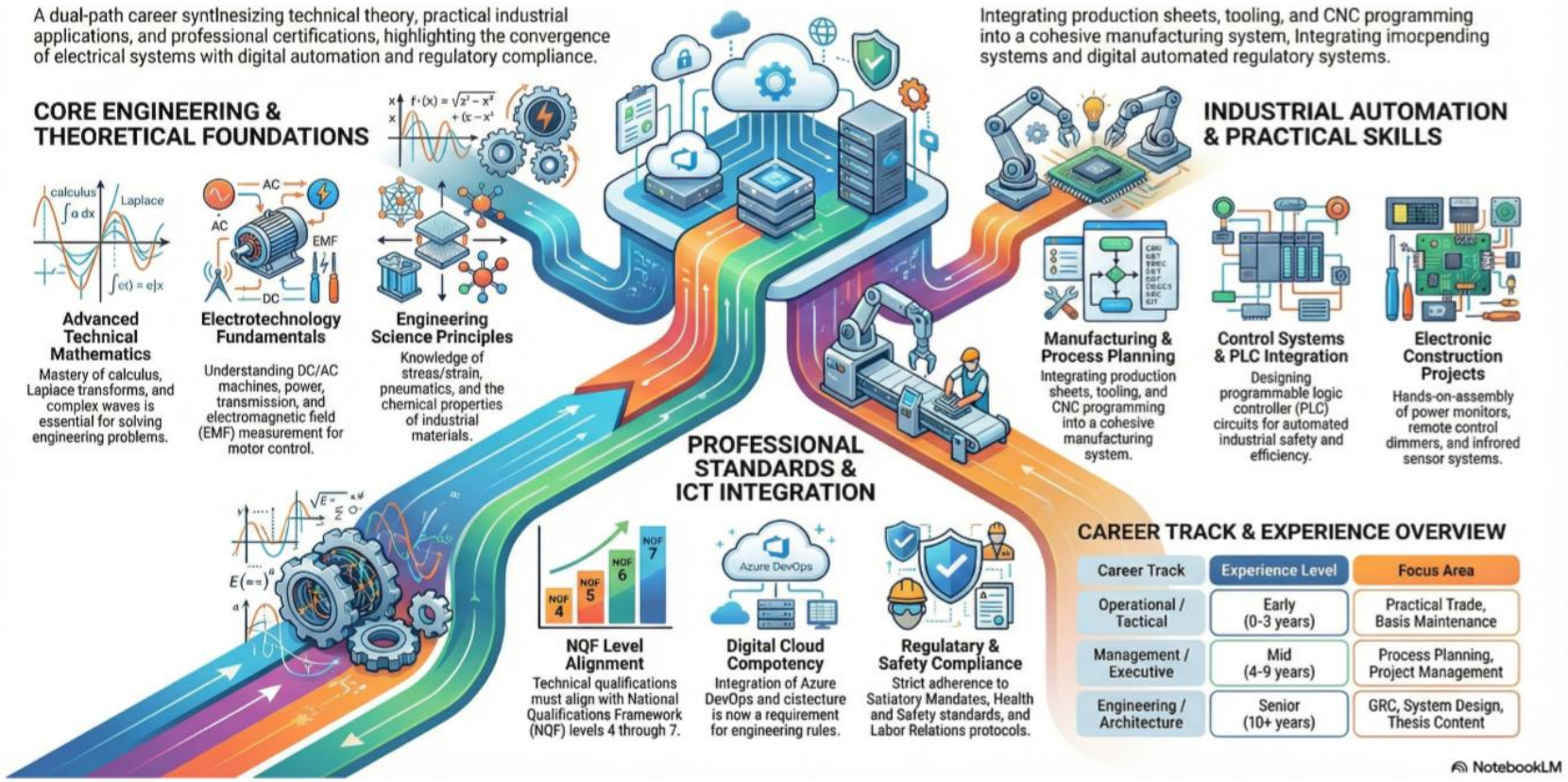

Bridging Industrial Engineering and Digital Security:
A Multidisciplinary Dossier
Industrial & Engineering Foundations
Core Electrical & Mechanical Mastery
Advanced expertise in circuit design, PLC wiring, EMF motor control, and industrial manufacturing processes.
Nated & TVET Curriculum Standards
Extensive background in NT-N3 trade theory, engineering science, and vocational technical education framework implementation.
Industrial Safety & Quality Control
Focus on workplace safety standards, inspection protocols, and mechanical plant layout optimization.
Digital Transformation & Security Compliance
900+ Microsoft Learning Modules Completed
Deep technical competency in Azure Cloud, AI Search, and Enterprise Security Architecture.
Cybersecurity & Policing Convergence
Integration of counter-terrorism policing standards with modern Cybersecurity GRC (Governance, Risk, and Compliance) frameworks.
Statutory Mandate & Intelligence
Professional focus on PSIRA regulations, labor relations in education, and investigative principles for intelligence.
Expertise Cluster & Key Domain Focus
Engineering
Electrical Trade Theory, Power Systems, Industrial Electronics
Security
Counter-Terrorism Policing, ISC2 Security Congress, GRC
IT/Cloud
Microsoft Azure AI, SOL Administration, DevOps Pipelines
NotebookLM


Professional Competency Blueprint: Engineering, ICT & Security
Industrial & Electrical Engineering
Digital Systems & Security Governance
Advanced Power Systems Mastery
Expertise in AC/DC machines, power factor compensation, and industrial plant layout design.
Manufacturing & Design Proficiency
Advanced skills in PCB layout, CNC programming, and thermal efficiency and heat balance.
Electrotechnical Safety & Control
Implementation of PLC wiring, thyristor devices, and automated electronics safety systems.
730+
Hours of Technical Training
Compilation of over 920 modules in cloud computing, data science, and security.
Cybersecurity & GRC Integration
Strategic focus on Governance, Risk, and Compliance (GRC) within national qualification frameworks.
Security & Policing Frameworks
Proficiency in incident investigation, community policing tactics, and counter-terrorism infrastructure management.
Engineering
Architecture & Operations
Senior (10+ years)
Cybersecurity
GRC & Tactical
Mid to Senior
Public Safety
Investigative & Management
Operational/Tactical
NotebookLM

The Technical Career Blueprint: Bridging Engineering, ICT, and Industry Standards

A dual-path career syntlnesizing technical theory, practical industrial applications, and professional certifications, highlighting the convergence of electrical systems with digital automation and regulatory compliance.

Integrating production sheets, tooling, and CNC programming into a cohesive manufacturing system, Integrating imocpending systems and digital automated regulatory systems.


CORE ENGINEERING & THEORETICAL FOUNDATIONS
INDUSTRIAL AUTOMATION & PRACTICAL SKILLS
calculus
Laplace
AC
EMF
DC
Advanced Technical Mathematics
Mastery of calculus, Laplace transforms, and complex waves is essential for solving engineering problems.
Electrotechnology Fundamentals
Understanding DC/AC machines, power, transmission, and electromagnetic field (EMF) measurement for motor control.
Engineering Science Principles
Knowledge of streas/strain, pneumatics, and the chemical properties of industrial materials.
Manufacturing & Process Planning
Integrating production sheets, tooling, and CNC programming into a cohesive manufacturing system.
Control Systems & PLC Integration
Designing programmable logic controller (PLC) circuits for automated industrial safety and efficiency.
Electronic Construction Projects
Hands-on-assembly of power monitors, remote control dimmers, and infrored sensor systems.
PROFESSIONAL STANDARDS & ICT INTEGRATION
NQF 4
NQF 5
NQF 6
NQF 7
NQF Level Alignment
Technical qualifications must align with National Qualifications Framework (NQF) levels 4 through 7.
Azure DevOps
Digital Cloud Competency
Integration of Azure DevOps and cistecture is now a requirement for engineering rules.
Regulatary & Safety Compliance
Strict adherence to Satiatory Mandates, Health and Safety standards, and Labor Relations protocols.

CAREER TRACK & EXPERIENCE OVERVIEW

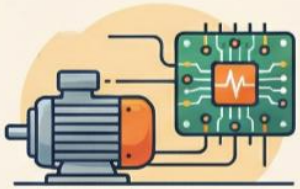
Career Track	Experience Level	Focus Area
Operational / Tactical	Early (0-3 years)	Practical Trade, Basis Maintenance
Management / Executive	Mid (4-9 years)	Process Planning, Project Management
Engineering / Architecture	Senior (10+ years)	GRC, System Design, Thesis Content

NotebookLM

Professional Technical Profile: Engineering, Security & Digital Systems

Synthesizing multidisciplinary expertise in electrical engineering, industrial automation, and modern cloud infrastructure with robust regulatory compliance.

Industrial Engineering & Power Systems



Advanced Electrical Control Expertise

Specialist knowledge in EMF measurement, PWM motor control, and PLC-driven industrial automation systems.

Power Infrastructure Monitoring

Design of digital outage monitors with tolerance delays to enhance home and industrial security.

Mechanical & Manufacturing Proficiency

Comprehensive understanding of process planning, CAD/CIM technology, and standardized industrial safety protocols.

Cloud, Security & Regulatory Integration

Security & Statutory Compliance

Expertise in PSIRA regulations, forensic investigation principles, and Private Security industry Regulation Act mandates.

Covering Azure Load Balancer, Traffic Manager, and AI Skill Challenges.

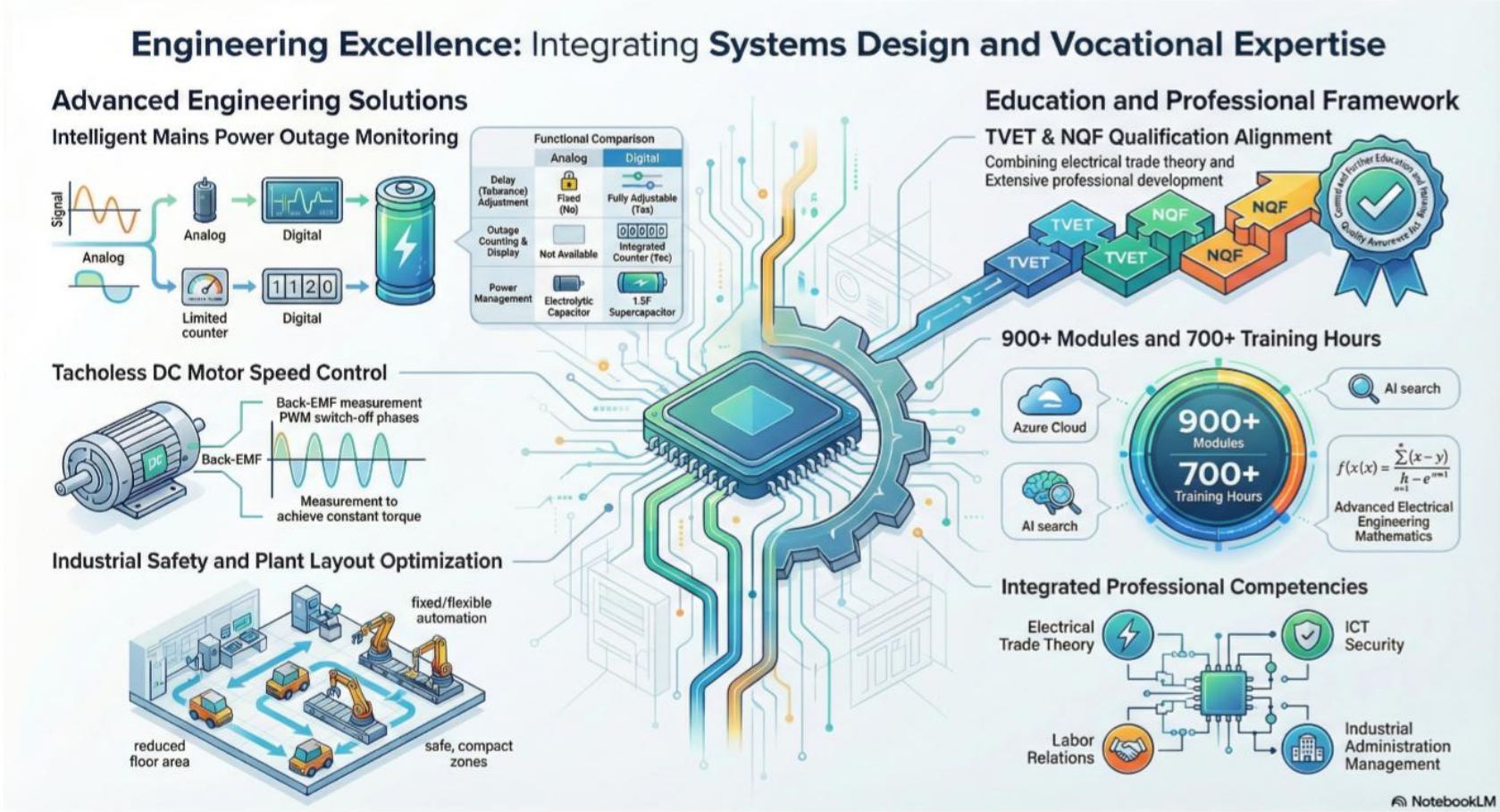
Modern Software Lifecycle Management

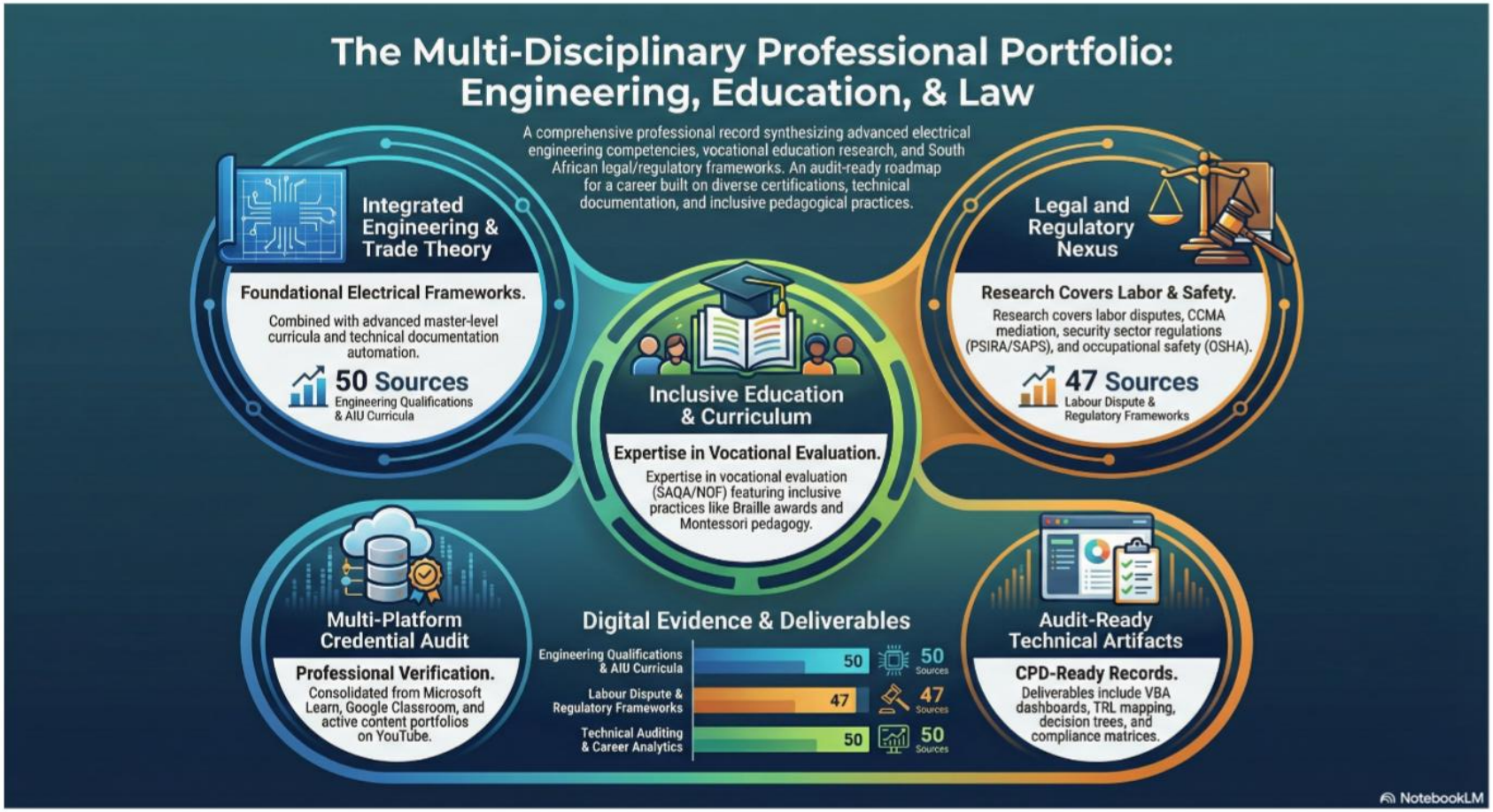
Proficient in DevOps environments using GitHub, Azure Pipelines, and languages including C# and Java.

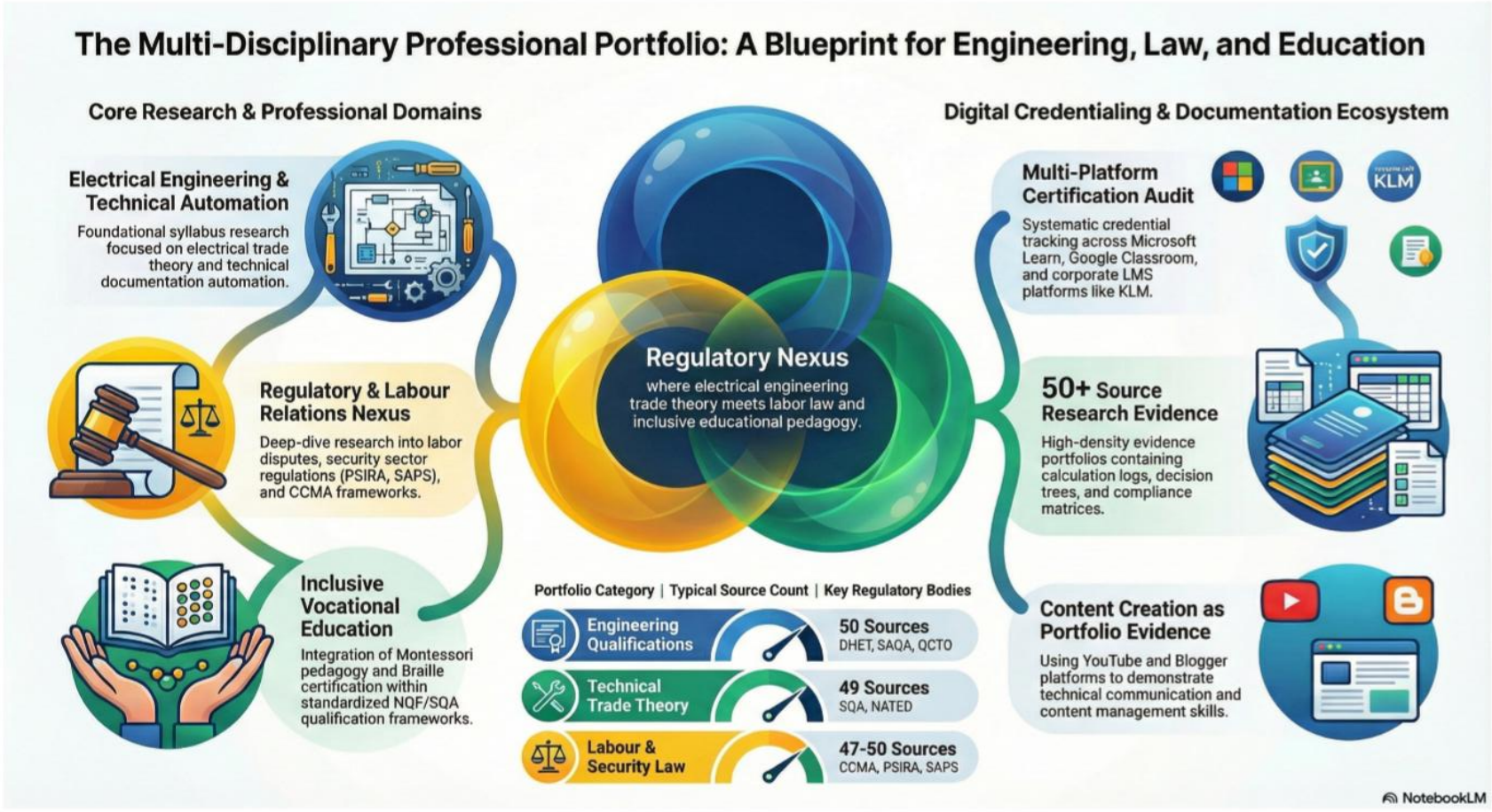
Core Competencies by Sector

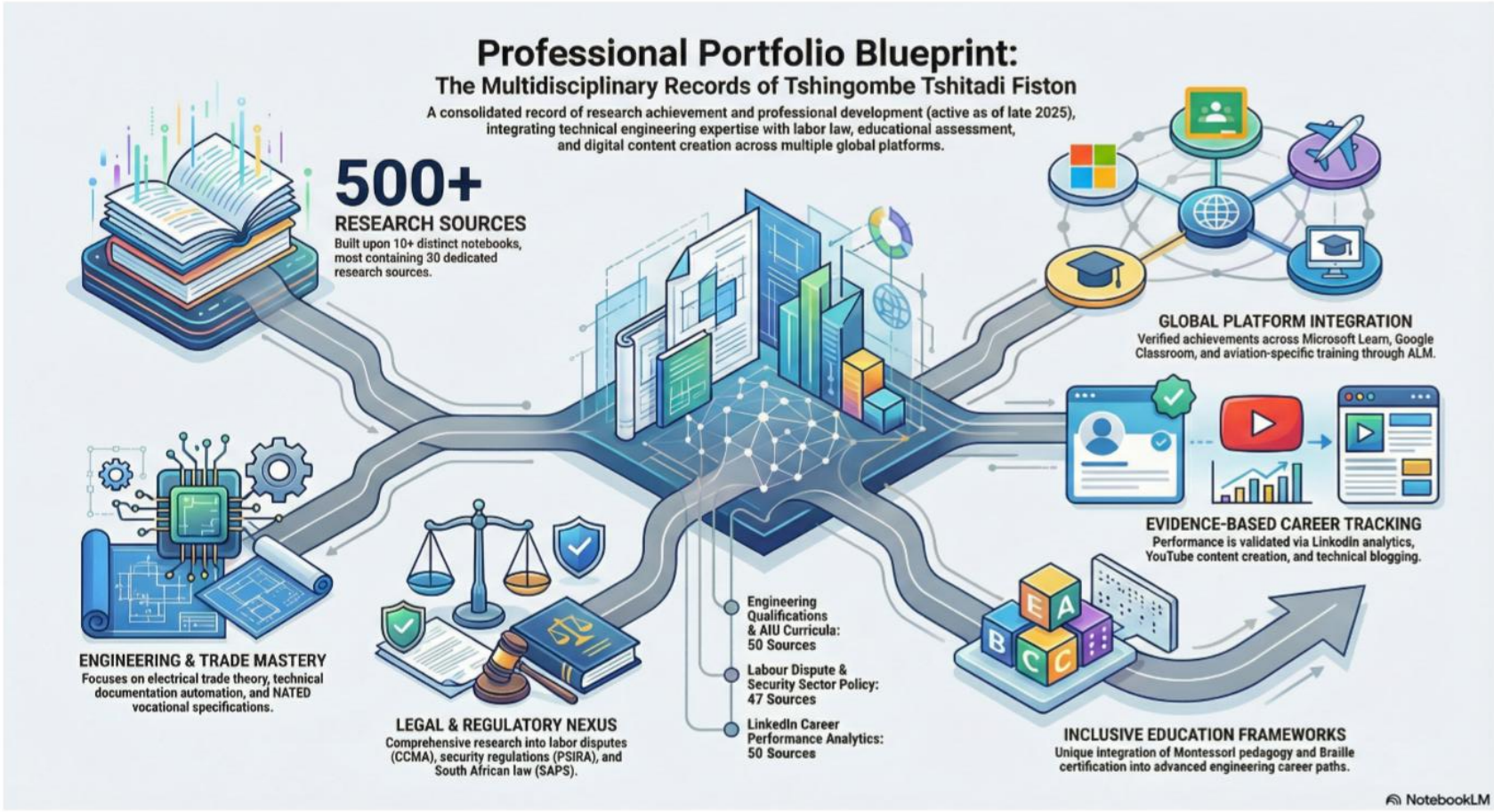
Power/Energy	Digital Tech	Governance
PV Installations	Cloud Architecture (Azure)	GRC (Governance, Risk, Compliance)
Mains Monitoring	Full Stack Dev	PSIRA
Energy Sourcing	AI Search	NQF Standards

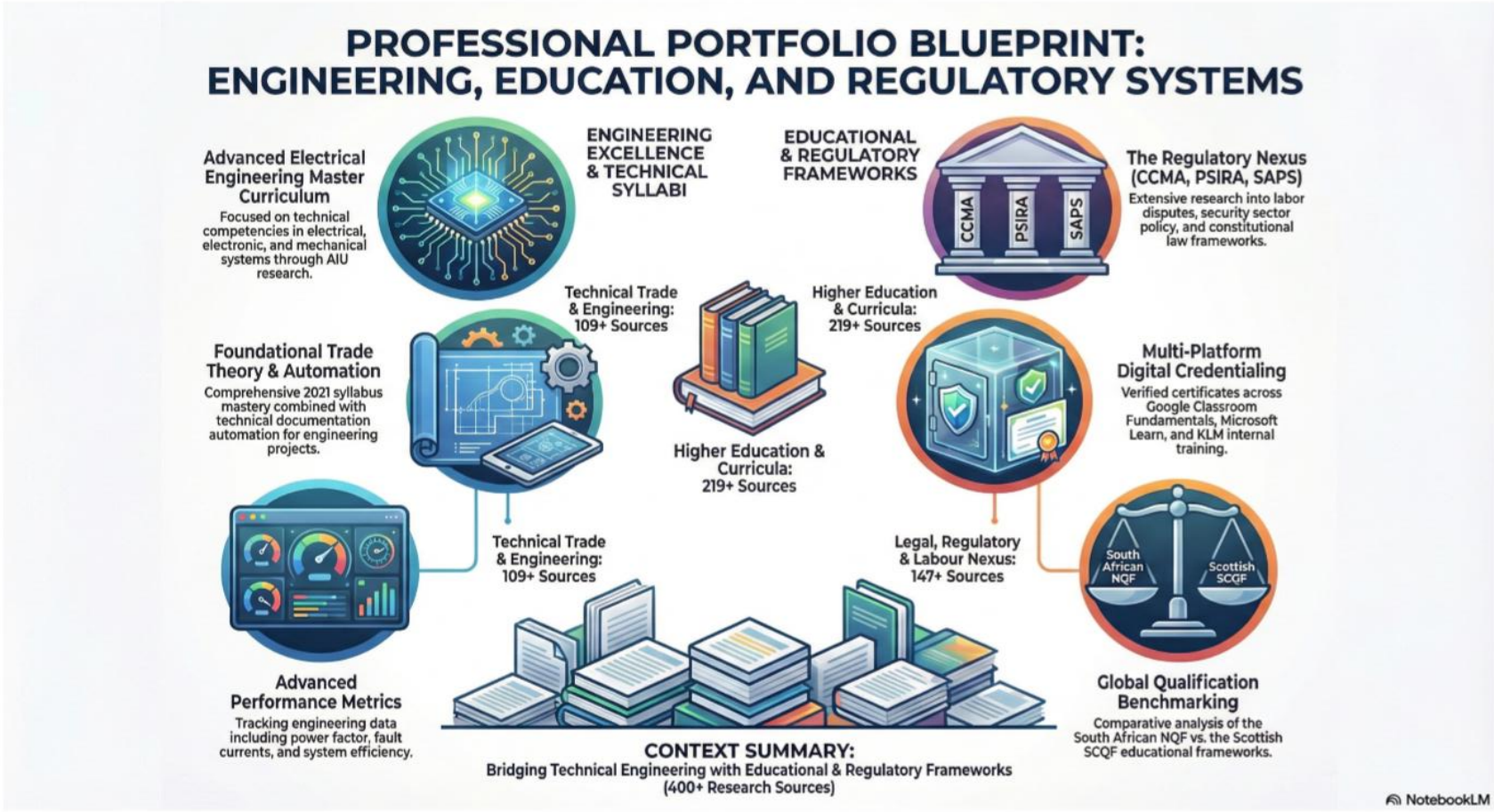
NotebookLM


Engineering Excellence: Integrating Systems Design and Vocational Expertise
Advanced Engineering Solutions
Intelligent Mains Power Outage Monitoring
Signal
Analog
Analog
Digital
Limited counter
Digital
1120
Functional Comparison
Analog
Digital
Delay (Tabrance) Adjustment
Fixed (No)
Fully Adjustable (Tas)
Outage Counting & Display
Not Available
Integrated Counter (Tec)
Power Management
Electrolytic Capacitor
1.5F Supercapacitor
Tacholess DC Motor Speed Control
Back-EMF measurement
PWM switch-off phases
Back-EMF
Measurement to achieve constant torque
Industrial Safety and Plant Layout Optimization
fixed/flexible automation
reduced floor area
safe, compact zones
Education and Professional Framework
TVET & NQF Qualification Alignment
Combining electrical trade theory and Extensive professional development
TVET
TVET
NQF
NQF
NQF
900+ Modules and 700+ Training Hours
Azure Cloud
AI search
900+
Modules
700+
Training Hours
AI search
Advanced Electrical Engineering Mathematics
Integrated Professional Competencies
Electrical Trade Theory
ICT Security
Labor Relations
Industrial Administration Management
NotebookLM


The Multi-Disciplinary Professional Portfolio: Engineering, Education, & Law
A comprehensive professional record synthesizing advanced electrical engineering competencies, vocational education research, and South African legal/regulatory frameworks. An audit-ready roadmap for a career built on diverse certifications, technical documentation, and inclusive pedagogical practices.
Integrated Engineering & Trade Theory
Foundational Electrical Frameworks.
Combined with advanced master-level curricula and technical documentation automation.
50 Sources
Engineering Qualifications & AIU Curricula
Legal and Regulatory Nexus
Research Covers Labor & Safety.
Research covers labor disputes, CCMA mediation, security sector regulations (PSIRA/SAPS), and occupational safety (OSHA).
47 Sources
Labour Dispute & Regulatory Frameworks
Inclusive Education & Curriculum
Expertise in Vocational Evaluation.
Expertise in vocational evaluation (SAQA/NOF) featuring inclusive practices like Braille awards and Montessori pedagogy.
Multi-Platform Credential Audit
Professional Verification.
Consolidated from Microsoft Learn, Google Classroom, and active content portfolios on YouTube.
Digital Evidence & Deliverables
Engineering Qualifications & AIU Curricula
50
50 Sources
Labour Dispute & Regulatory Frameworks
47
47 Sources
Technical Auditing & Career Analytics
50
50 Sources
Audit-Ready Technical Artifacts
CPD-Ready Records.
Deliverables include VBA dashboards, TRL mapping, decision trees, and compliance matrices.
NotebookLM

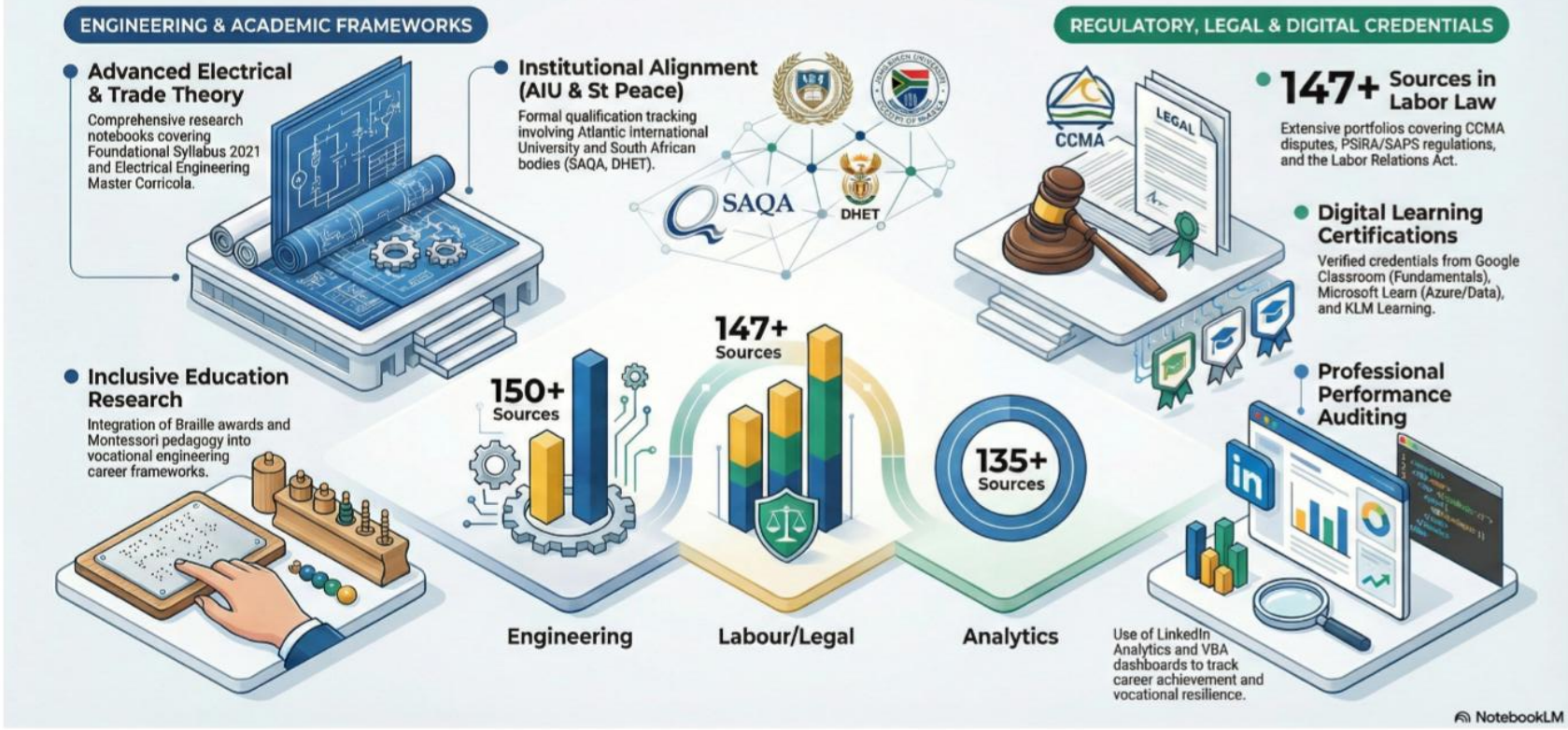

The Multi-Disciplinary Professional Portfolio: A Blueprint for Engineering, Law, and Education
Core Research & Professional Domains
Electrical Engineering & Technical Automation
Foundational syllabus research focused on electrical trade theory and technical documentation automation.
Regulatory & Labour Relations Nexus
Deep-dive research into labor disputes, security sector regulations (PSIRA, SAPS), and CCMA frameworks.
Inclusive Vocational Education
Integration of Montessori pedagogy and Braille certification within standardized NQF/SQA qualification frameworks.
Regulatory Nexus
where electrical engineering trade theory meets labor law and inclusive educational pedagogy.
Portfolio Category | Typical Source Count | Key Regulatory Bodies
Engineering Qualifications
50 Sources
DHET, SAQA, QCTO
Technical Trade Theory
49 Sources
SQA, NATED
Labour & Security Law
47-50 Sources
CCMA, PSIRA, SAPS
Digital Credentialing & Documentation Ecosystem
Multi-Platform Certification Audit
Systematic credential tracking across Microsoft Learn, Google Classroom, and corporate LMS platforms like KLM.
KLM
50+ Source Research Evidence
High-density evidence portfolios containing calculation logs, decision trees, and compliance matrices.
Content Creation as Portfolio Evidence
Using YouTube and Blogger platforms to demonstrate technical communication and content management skills.
NotebookLM

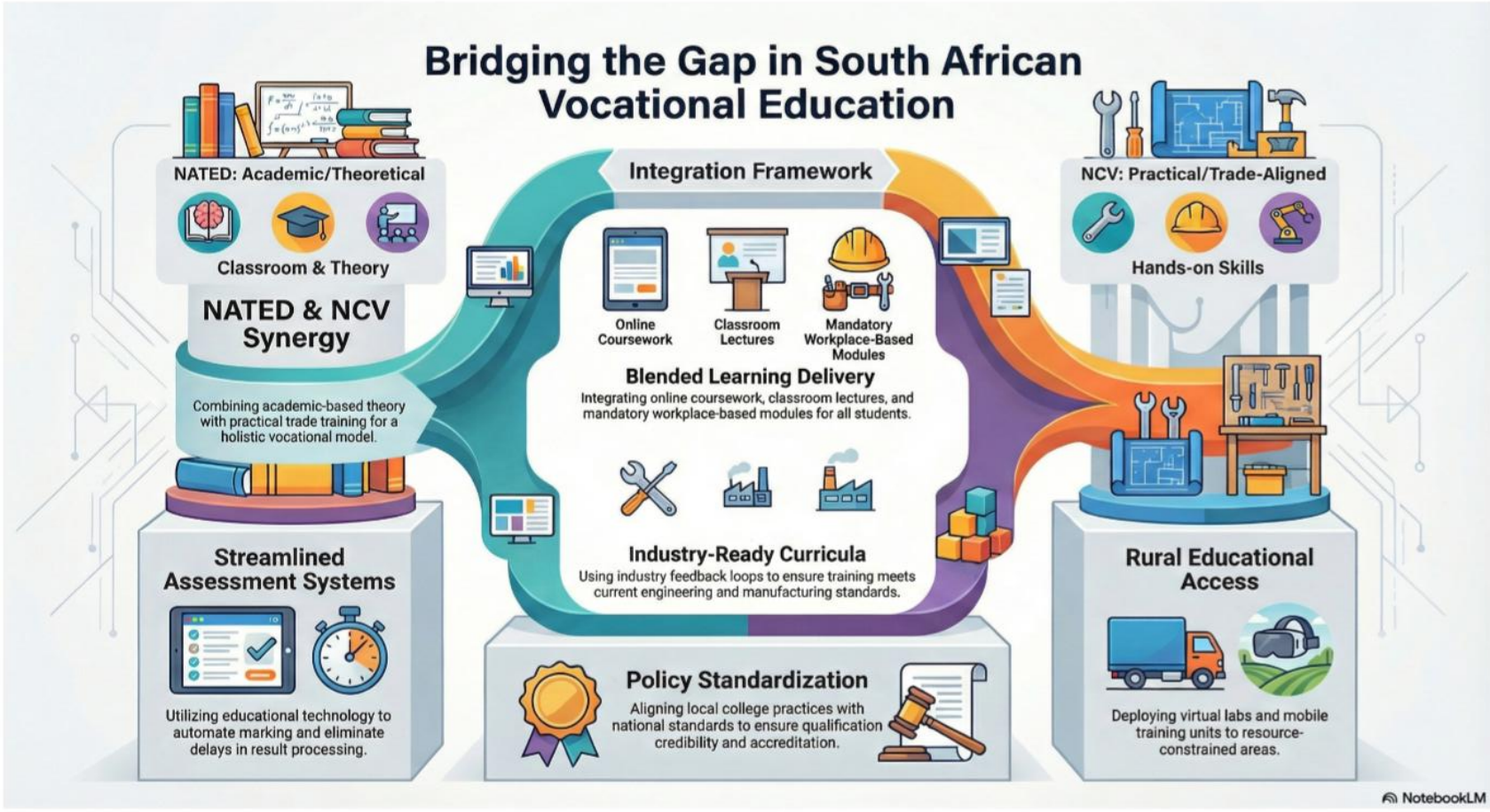

Professional Portfolio Blueprint:
The Multidisciplinary Records of Tshingombe Tshitadi Fiston
A consolidated record of research achievement and professional development (active as of late 2025), integrating technical engineering expertise with labor law, educational assessment, and digital content creation across multiple global platforms.
500+
RESEARCH SOURCES
Built upon 10+ distinct notebooks, most containing 30 dedicated research sources.
GLOBAL PLATFORM INTEGRATION
Verified achievements across Microsoft Learn, Google Classroom, and aviation-specific training through ALM.
EVIDENCE-BASED CAREER TRACKING
Performance is validated via LinkedIn analytics, YouTube content creation, and technical blogging.
ENGINEERING & TRADE MASTERY
Focuses on electrical trade theory, technical documentation automation, and NATED vocational specifications.
LEGAL & REGULATORY NEXUS
Comprehensive research into labor disputes (CCMA), security regulations (PSIRA), and South African law (SAPS).
Engineering Qualifications & AIU Curricula: 50 Sources
Labour Dispute & Security Sector Policy: 47 Sources
LinkedIn Career Performance Analytics: 50 Sources
INCLUSIVE EDUCATION FRAMEWORKS
Unique integration of Montessori pedagogy and Braille certification into advanced engineering career paths.
NotebookLM


PROFESSIONAL PORTFOLIO BLUEPRINT:
ENGINEERING, EDUCATION, AND REGULATORY SYSTEMS
Advanced Electrical Engineering Master Curriculum
Focused on technical competencies in electrical, electronic, and mechanical systems through AIU research.
ENGINEERING EXCELLENCE & TECHNICAL SYLLABI
EDUCATIONAL & REGULATORY FRAMEWORKS
CCMA
PSIRA
SAPS
The Regulatory Nexus (CCMA, PSIRA, SAPS)
Extensive research into labor disputes, security sector policy, and constitutional law frameworks.
Technical Trade & Engineering: 109+ Sources
Higher Education & Curricula: 219+ Sources
Foundational Trade Theory & Automation
Comprehensive 2021 syllabus mastery combined with technical documentation automation for engineering projects.
Higher Education & Curricula: 219+ Sources
Multi-Platform Digital Credentialing
Verified certificates across Google Classroom Fundamentals, Microsoft Learn, and KLM internal training.
Technical Trade & Engineering: 109+ Sources
Legal, Regulatory & Labour Nexus: 147+ Sources
South African NQF
Scottish SCQF
Advanced Performance Metrics
Tracking engineering data including power factor, fault currents, and system efficiency.
Global Qualification Benchmarking
Comparative analysis of the South African NQF vs. the Scottish SCQF educational frameworks.
CONTEXT SUMMARY:
Bridging Technical Engineering with Educational & Regulatory Frameworks
(400+ Research Sources)
NotebookLM

Multidimensional Professional Portfolio: Tshingombe Tshitadi Fiston

Infographic designal is a high-level overview of a comprehensive professional record spanning engineering, legal frameworks, and digital education.


ENGINEERING & ACADEMIC FRAMEWORKS
Advanced Electrical & Trade Theory
Comprehensive research notebooks covering Foundational Syllabus 2021 and Electrical Engineering Master Corricola.
Institutional Alignment (AIU & St Peace)
Formal qualification tracking involving Atlantic international University and South African bodies (SAQA, DHET).
SAQA
DHET
Inclusive Education Research
Integration of Braille awards and Montessori pedagogy into vocational engineering career frameworks.
150+ Sources
147+ Sources
135+ Sources
Engineering
Labour/Legal
Analytics
REGULATORY, LEGAL & DIGITAL CREDENTIALS
CCMA
LEGAL
147+ Sources in Labor Law
Extensive portfolios covering CCMA disputes, PSIRA/SAPS regulations, and the Labor Relations Act.
Digital Learning Certifications
Verified credentials from Google Classroom (Fundamentals), Microsoft Learn (Azure/Data), and KLM Learning.
Professional Performance Auditing
Use of LinkedIn Analytics and VBA dashboards to track career achievement and vocational resilience.
NotebookLM


Bridging the Gap in South African Vocational Education
NATED: Academic/Theoretical
Classroom & Theory
NATED & NCV Synergy
Combining academic-based theory with practical trade training for a holistic vocational model.
Integration Framework
Online Coursework
Classroom Lectures
Mandatory Workplace-Based Modules
Blended Learning Delivery
Integrating online coursework, classroom lectures, and mandatory workplace-based modules for all students.
Industry-Ready Curricula
Using industry feedback loops to ensure training meets current engineering and manufacturing standards.
NCV: Practical/Trade-Aligned
Hands-on Skills
Streamlined Assessment Systems
Utilizing educational technology to automate marking and eliminate delays in result processing.
Policy Standardization
Aligning local college practices with national standards to ensure qualification credibility and accreditation.
Rural Educational Access
Deploying virtual labs and mobile training units to resource-constrained areas.
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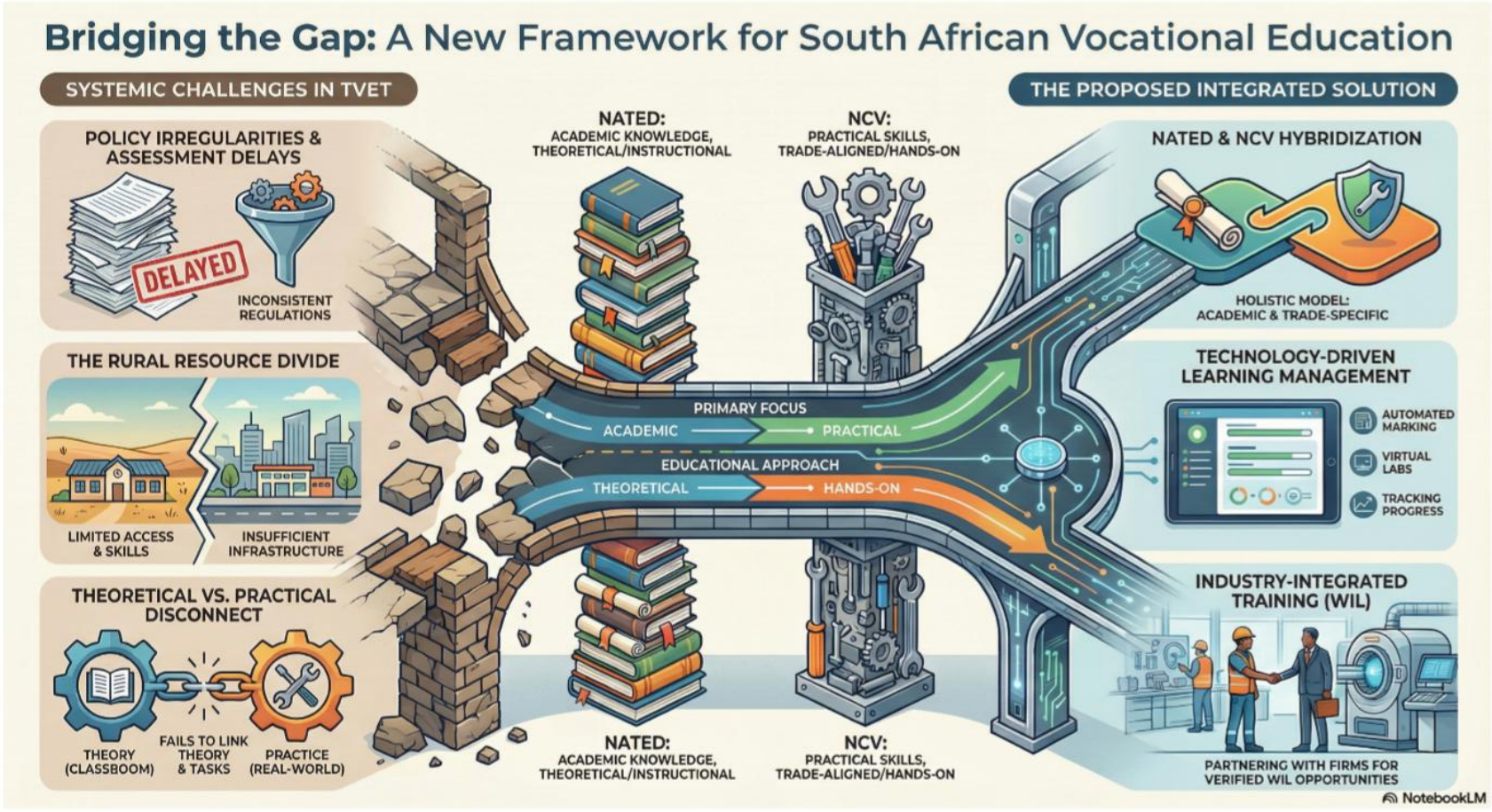
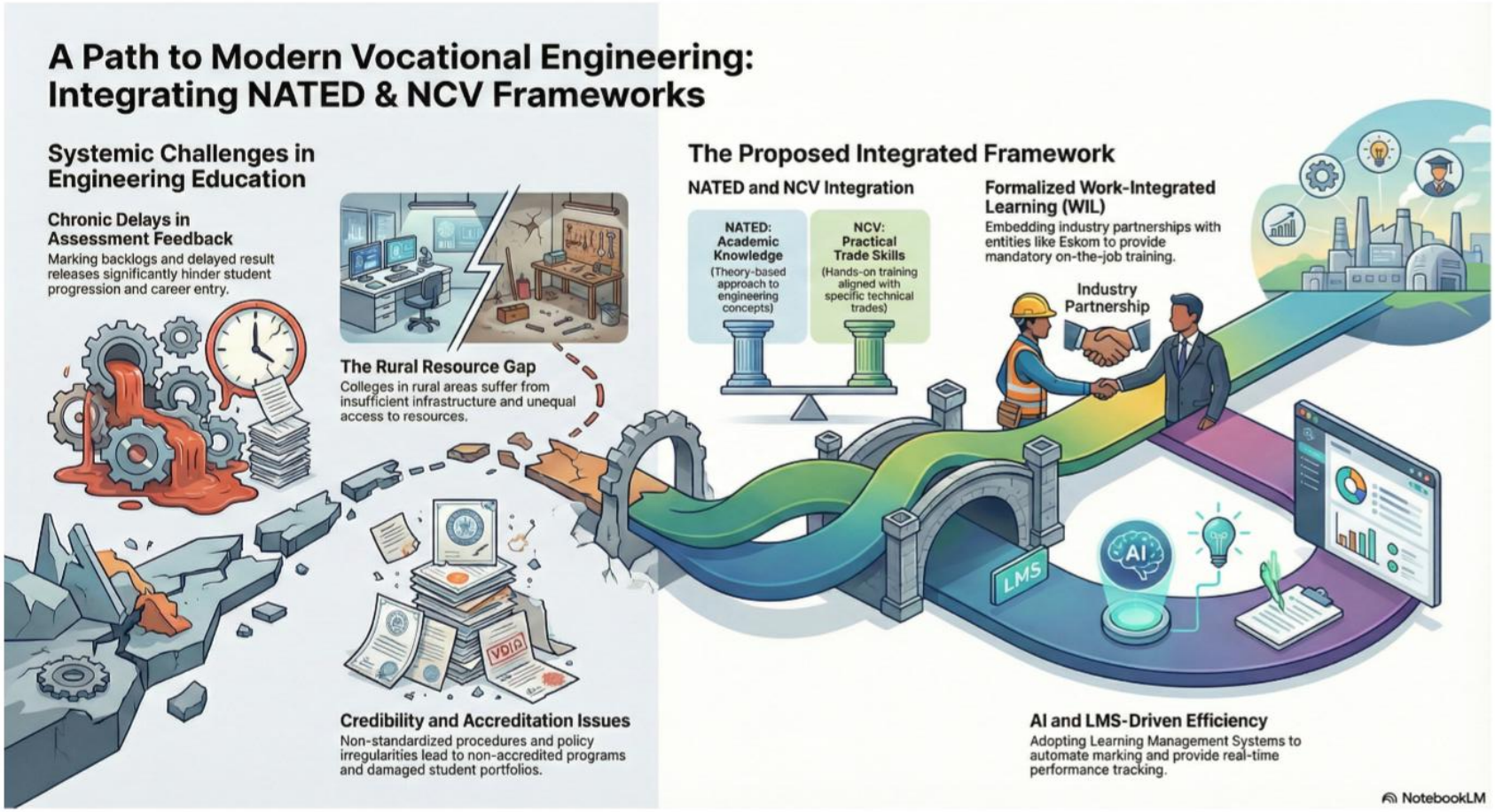

Bridging the Gap: A New Framework for South African Vocational Education
SYSTEMIC CHALLENGES IN TVET
THE PROPOSED INTEGRATED SOLUTION
POLICY IRREGULARITIES & ASSESSMENT DELAYS
DELAYED
INCONSISTENT REGULATIONS
THE RURAL RESOURCE DIVIDE
LIMITED ACCESS & SKILLS
INSUFFICIENT INFRASTRUCTURE
THEORETICAL VS. PRACTICAL DISCONNECT
THEORY (CLASSBOOM)
FAILS TO LINK THEORY & TASKS
PRACTICE (REAL-WORLD)
NATED:
ACADEMIC KNOWLEDGE, THEORETICAL/INSTRUCTIONAL
NCV:
PRACTICAL SKILLS, TRADE-ALIGNED/HANDS-ON
PRIMARY FOCUS
ACADEMIC
PRACTICAL
EDUCATIONAL APPROACH
THEORETICAL
HANDS-ON
NATED:
ACADEMIC KNOWLEDGE, THEORETICAL/INSTRUCTIONAL
NCV:
PRACTICAL SKILLS, TRADE-ALIGNED/HANDS-ON
NATED & NCV HYBRIDIZATION
HOLISTIC MODEL: ACADEMIC & TRADE-SPECIFIC
TECHNOLOGY-DRIVEN LEARNING MANAGEMENT
AUTOMATED MARKING
VIRTUAL LABS
TRACKING PROGRESS
INDUSTRY-INTEGRATED TRAINING (WIL)
PARTNERING WITH FIRMS FOR VERIFIED WIL OPPORTUNITIES
NotebookLM


A Path to Modern Vocational Engineering: Integrating NATED & NCV Frameworks
Systemic Challenges in Engineering Education
Chronic Delays in Assessment Feedback
Marking backlogs and delayed result releases significantly hinder student progression and career entry.
The Rural Resource Gap
Colleges in rural areas suffer from insufficient infrastructure and unequal access to resources.
Credibility and Accreditation Issues
Non-standardized procedures and policy irregularities lead to non-accredited programs and damaged student portfolios.
The Proposed Integrated Framework
NATED and NCV Integration
NATED: Academic Knowledge
(Theory-based approach to engineering concepts)
NCV: Practical Trade Skills
(Hands-on training aligned with specific technical trades)
Formalized Work-Integrated Learning (WIL)
Embedding industry partnerships with entities like Eskom to provide mandatory on-the-job training.
Industry Partnership
LMS
AI
AI and LMS-Driven Efficiency
Adopting Learning Management Systems to automate marking and provide real-time performance tracking.
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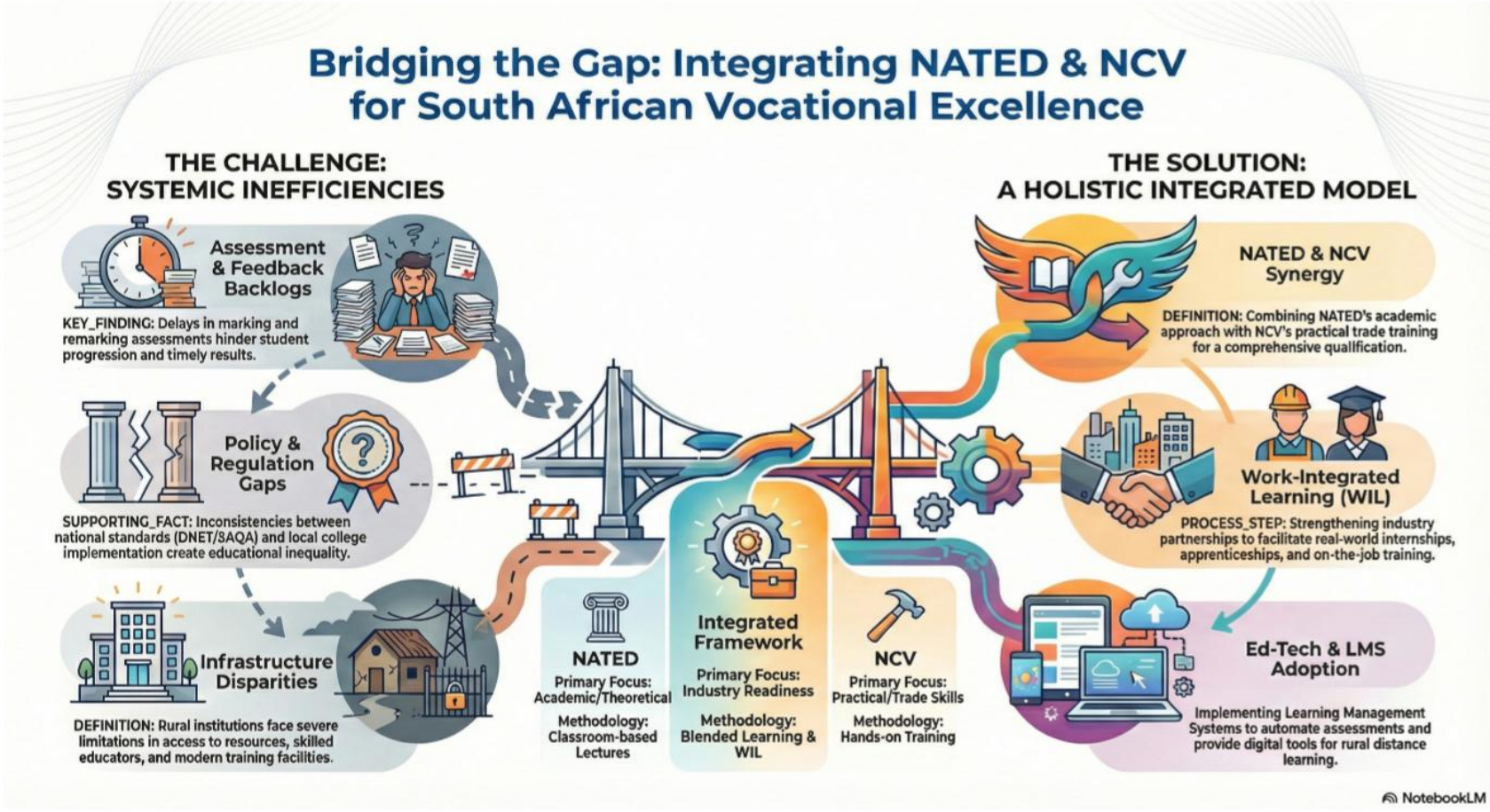
Bridging the Gap: Integrating NATED & NCV for South African Vocational Excellence
THE CHALLENGE: SYSTEMIC INEFFICIENCIES
Assessment & Feedback Backlogs
KEY_FINDING: Delays in marking and remarking assessments hinder student progression and timely results.
Policy & Regulation Gaps
SUPPORTING_FACT: Inconsistencies between national standards (DNET/SAQA) and local college implementation create educational inequality.
Infrastructure Disparities
DEFINITION: Rural institutions face severe limitations in access to resources, skilled educators, and modern training facilities.
THE SOLUTION: A HOLISTIC INTEGRATED MODEL
NATED & NCV Synergy
DEFINITION: Combining NATED's academic approach with NCV's practical trade training for a comprehensive qualification.
Work-Integrated Learning (WIL)
PROCESS_STEP: Strengthening industry partnerships to facilitate real-world internships, apprenticeships, and on-the-job training.
Ed-Tech & LMS Adoption
Implementing Learning Management Systems to automate assessments and provide digital tools for rural distance learning.
NATED
Primary Focus: Academic/Theoretical
Methodology: Classroom-based Lectures
Integrated Framework
Primary Focus: Industry Readiness
Methodology: Blended Learning & WIL
NCV
Primary Focus: Practical/Trade Skills
Methodology: Hands-on Training
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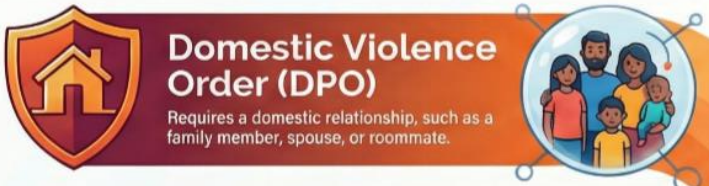
Navigating Protection Orders in South Africa: Domestic Violence vs. Harassment

The South African judicial system provides protection through two specific acts: the Domestic Violence Act (116 of 1998) and the Protection from Harassment Act (17 of 2011). While both aim to stop abuse, they differ significantly based on the relationship between parties and the nature of the behavior.



Domestic Violence Order (DPO)

Requires a domestic relationship, such as a family member, spouse, or roommate.

Pattern of Abuse
Repetitive actions required

Common Forms
Physical, sexual, or financial abuse

Relationship	Required (Domestic)
Frequency	Repetitive pattern of abuse

Harassment Protection Order (HPO)

No relationship is required; applicable against neighbors, strangers, or anyone outside the home.

Relationship	Not Required (Strangers/Heighbors)
Frequency	Single offense may be sufficient

First Offense
Can be granted for a single incident

Common Forms
Stalking, messaging, or unwanted packages

The 3-Step Legal Path to Safety

Step 1: Complete Form 2 and Affidavit

Document specific dates, times, and places of incidents thoroughly.

Step 2: Service of the Interim Order

The order is only valid once personally served by a sheriff or police.

Step 3: Violation Penalties

Breaching a final order can result in up to 5 years imprisonment.

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